

## 2.4 Existing Traffic Operational Analysis

Level of service (LOS) is a qualitative measure used to gauge traffic operational performance by describing the driver's experience within a traffic stream in terms of service measures such as speed and travel time, freedom to maneuver, traffic interruptions and delay, and comfort and convenience. Six levels of service are defined by the Highway Capacity Manual 2000. Letters designate each level—from LOS A (indicating traffic flows with little or no delay) to LOS F (indicating over-saturated conditions where traffic flow exceeds freeway capacity, generally resulting in long queues and delays). The Highway Capacity Manual 2000-defined level of service criteria for intersections are presented in Table 2-3. The level of service criteria for density on freeways are presented in Table 2-4.

The following studies undertaken for projects located within metropolitan Bakersfield were reviewed to determine if potential study intersections had been recently evaluated: *Hageman Road Extension to Golden State Avenue Traffic Report*, Parsons 2009; *Hosking Avenue/State Route 99 Interchange Traffic Report*, Parsons 2008; *Bakersfield Commons Mixed-Use Transportation Impact Report*, Gibson Transportation Consulting, 2010; *Stockdale Ranch DEIR*, RBF Consulting 2009; *Rosedale Highway Widening Project*, Fehr & Peers 2009. Based on this review of potential study intersections, a subset of key intersections were selected for analysis. The selection was based on a determination of which intersections could potentially be impacted by the Centennial Corridor project various build alternatives. Figure 2-13 illustrates the locations of the study intersections selected for detailed evaluation, while Figure 2-14 reports the AM and PM peak hour turning movement traffic volumes for these same intersections. Table 2-5 presents the results of the level of service analysis for these intersections.

Figure 2-15 depicts existing peak hour and daily traffic volumes for State Route 99 and State Route 58 freeway segments and ramps considered by this study. Tables 2-6, 2-7, 2-8 and 2-9 present the level of service results for these same freeway segments and ramps.

All of the freeway segment locations on State Route 58 eastbound operate at LOS D or better except for the Union Avenue off-ramp, which operates at LOS E during both peak hours and the Union Avenue off-ramp to on-ramp which operates at LOS C during the AM peak hour. The section between Chester Avenue and Union Avenue generally has the highest peak hour volumes in the study area. This results in higher density in this section.

In the study area, the State Route 58 westbound sections all operate at LOS D or better with the exception of the Brundage Lane off-ramp during the AM peak hour and the Chester Avenue off-ramp during both peak hours, which operate at LOS E.

The majority of the northbound State Route 99 analysis locations operate at LOS C or better. The following seven locations operate at LOS D:

- White Lane to Ming Avenue (AM peak hour)
- Ming Avenue on-ramp (AM peak hour)
- State Route 58 off-ramp (PM peak hour)
- State Route 58 on-ramp (AM peak hour)
- State Route 58 to California Avenue (AM peak hour)

- California Avenue to Rosedale Highway (AM peak hour)
- Rosedale Highway off-ramp (PM peak hour)

**Table 2-3. Level of Service Definitions for Intersections**

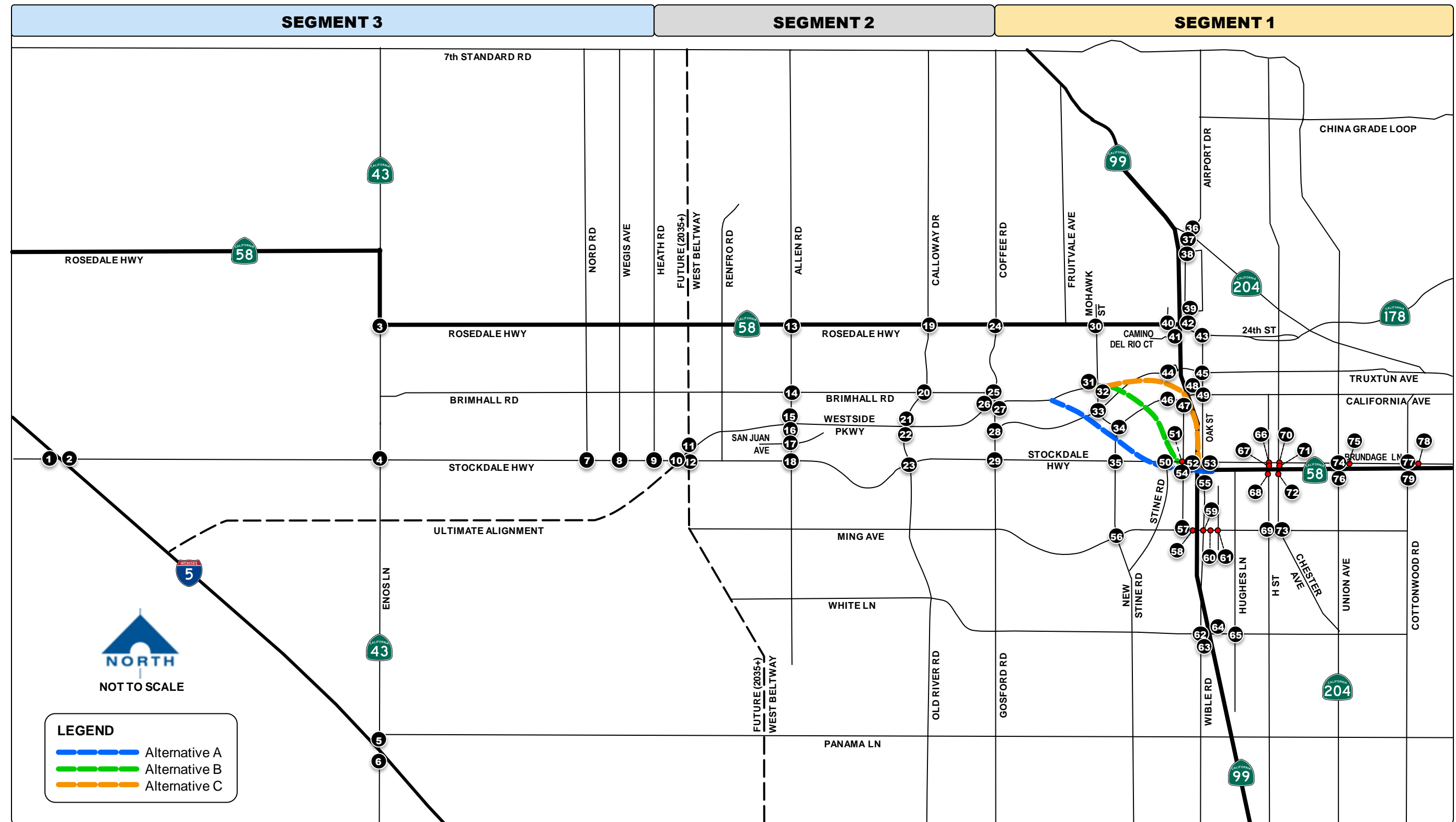
LOS	DESCRIPTION	CONTROL DELAY PER VEHICLE (sec/veh)	
		SIGNALIZED	UNSIGNALIZED
A	Traffic flows with very little delay and optimal speeds. Most vehicles do not stop at all.	0-10	<10
B	Traffic flows with very little delay and speeds may be slightly reduced. Very infrequent and short waits at traffic signals. More vehicles stop at intersections than for LOS A.	>10-15	>10-20
C	Traffic speeds continue to slow. Some vehicles may stop at this level, although many vehicles still pass through the intersection without stopping.	>15-25	>20-35
D	Congestion becomes more noticeable. Many vehicles stop and the proportion of vehicles not stopping declines.	>25-35	>35-55
E	Low speeds and traffic backups at intersections. Often considered to be the limit of acceptable delay.	>35-50	>55-80
F	Very slow speeds and congestion. Long traffic backups. Very likely to wait for multiple greens to get through an intersection. This is considered to be unacceptable for most drivers.	>50	>80

Source: Highway Capacity Manual 2000

**Table 2-4. Mainline and Freeway Ramp Level of Service Definitions**

LOS	DESCRIPTION	DENSITY (pc/mi/ln)	
		MAINLINE	RAMPS
A	Describes free-flow operations. Free-flow speeds prevail.	<11	<10
B	Represents reasonably free-flow operations and free-flow speeds are maintained.	>11 and <18	>10 and <20
C	Provides for flow with speeds at or near the free-flow speed of the freeway.	>18 and <26	>20 and <28
D	Describes the level at which speeds begin to decline slightly with increasing flows and density begins to increase somewhat more quickly.	>26 and <35	>28 and <35
E	At this level's highest density value, it describes operation that is at capacity of the freeway.	>35 and <45	>35
F	Describes breakdown in vehicular flow and queues forming behind the breakdown points.	>45	Demand exceeds capacity

Source: Highway Capacity Manual 2000



**Figure 2-13: Locations of Study Intersections**

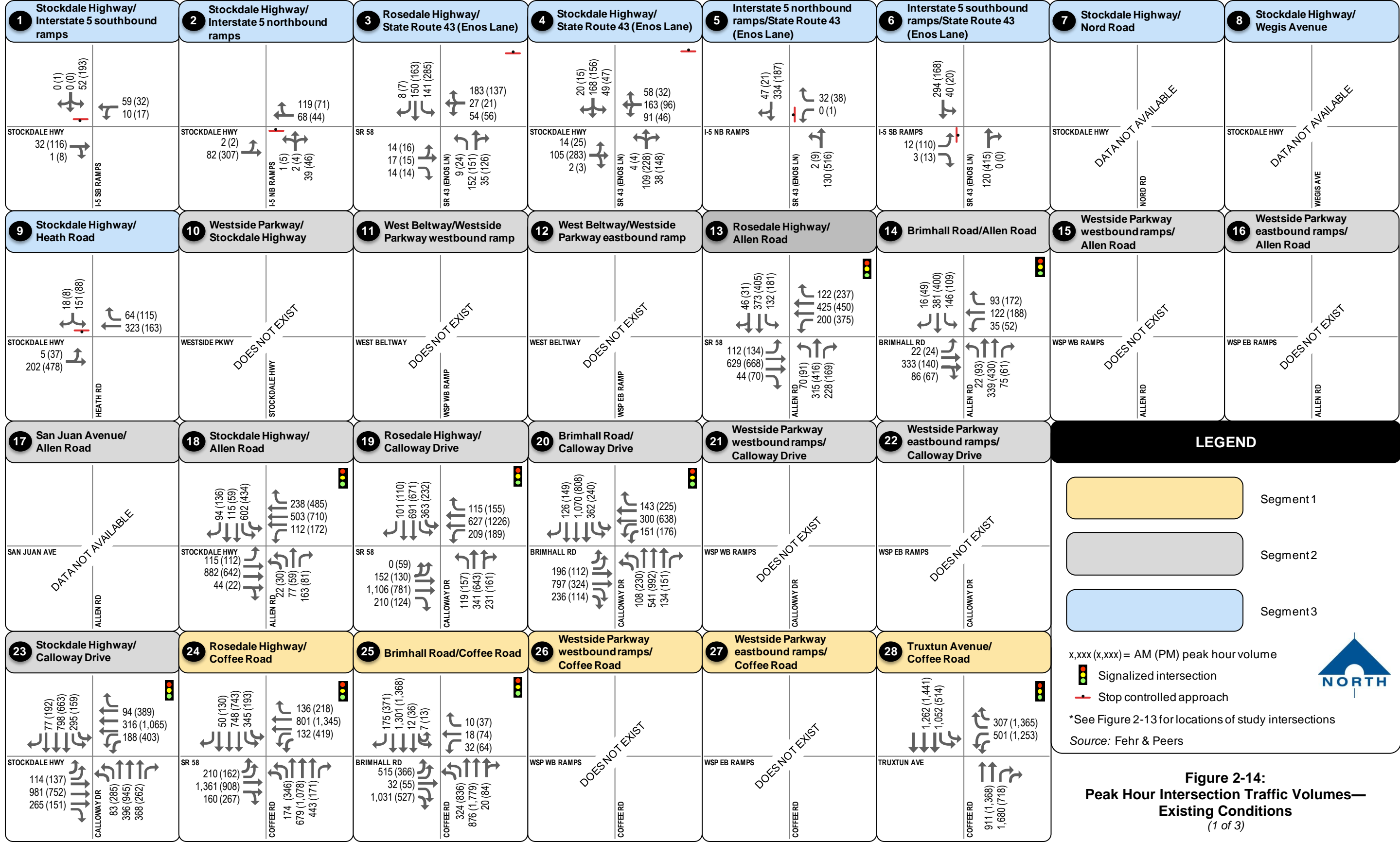


Figure 2-14:  
Peak Hour Intersection Traffic Volumes—  
Existing Conditions  
(1 of 3)

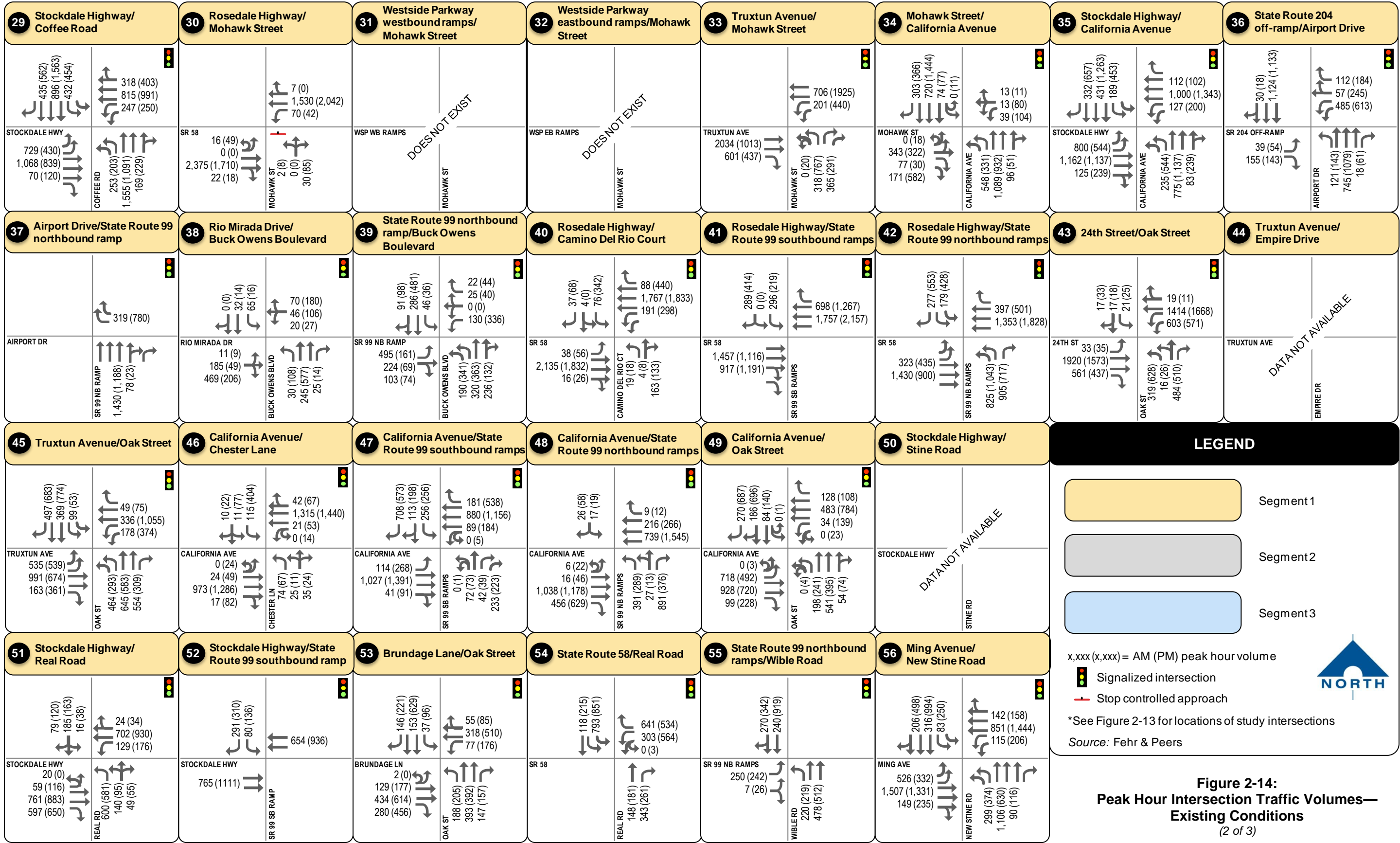
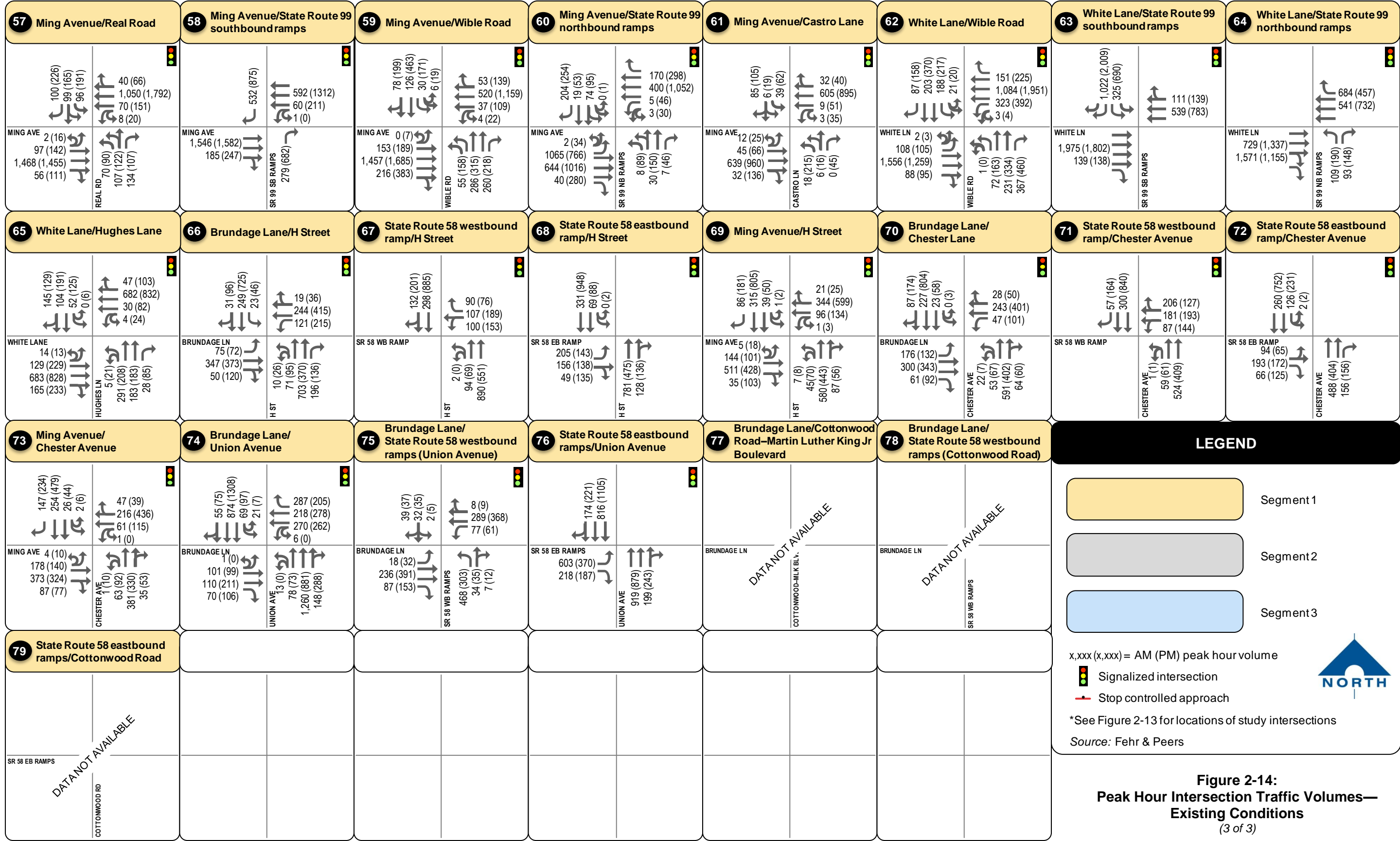
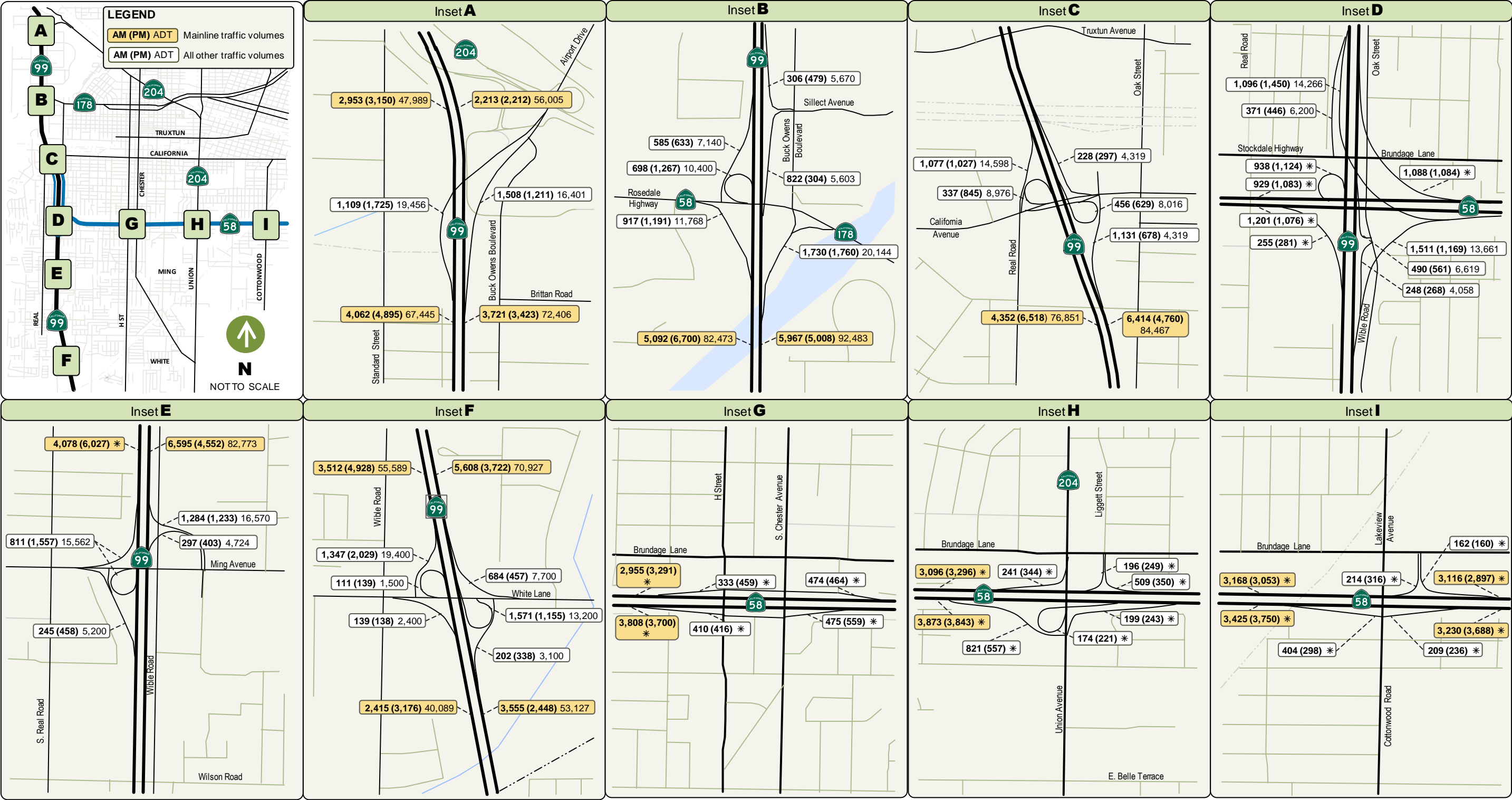


Figure 2-14:  
Peak Hour Intersection Traffic Volumes—  
Existing Conditions  
(2 of 3)





Source: Parsons

\* Data not available

Figure 2-15:  
Peak Hour and Daily Freeway Volumes—  
Existing Conditions

Table 2-5. Existing Conditions Intersection Level of Service Analysis (1 of 2)

INTERSECTION	CONTROL	AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
1. I-5 SB ramps/Stockdale Highway	NB/SB two-way stop	B	10.2	C	15.1
	Imp-Signal*	N/A			
2. I-5 NB ramps/Stockdale Highway	NB/SB two-way stop	A	9.5	B	11.7
3. SR 43 (Enos Lane)/Rosedale Highway	4-way stop	B	12.0	B	14.9
	Imp-Signal	N/A			
4. SR 43 (Enos Lane)/Stockdale Highway	4-way stop	B	14.9	D	31.7
	Imp-Signal*	N/A			
5. SR 43 (Enos Lane)/I-5 NB ramps	EB/WB two-way stop	B	11.9	C	15.6
6. SR 43 (Enos Lane)/I-5 SB ramps	EB/WB two-way stop	B	14.5	D	26.9
7. Stockdale Highway/Nord Road	Signal	N/A			
8. Stockdale Highway/Wegis Avenue	NB/SB two-way stop	N/A			
	Imp-Signal*	N/A			
9. Stockdale Highway/Heath Road	Stop (existing) Signal (future)	C	18.2	C	22.2
10. Stockdale Highway/Westside Parkway	Signal	Does not exist			
11. West Beltway/Westside Parkway WB ramp	Signal	Does not exist			
12. West Beltway/Westside Parkway EB ramp	Signal	Does not exist			
13. Allen Road/Rosedale Highway	Signal*	D	37.3	E	76.9
14. Allen Road/Brimhall Road	Signal	C	21.2	B	19.9
15. Allen Road/Westside Parkway WB ramps	Signal	Does not exist			
16. Allen Road/Westside Parkway EB ramps	Signal	Does not exist			
17. Allen Road/San Juan Avenue	Signal*	Does not exist			
18. Allen Road/Stockdale Highway	Signal	D	39.0	C	27.0
19. Calloway Drive/Rosedale Highway	Signal*	E	69.0	F	91.0
20. Calloway Drive/Brimhall Road	Signal	C	31.9	C	25.4
21. Calloway Drive/Westside Parkway WB ramps	Signal	Does not exist			
22. Calloway Drive/Westside Parkway EB ramps	Signal	Does not exist			
23. Calloway Drive/Stockdale Highway	Signal	D	36.1	D	38.5
24. Coffee Road/Rosedale Highway*	Signal*	E	75.7	E	65.7
25. Coffee Road/Brimhall Road	Signal	E	60.1	E	72.7
26. Coffee Road/Westside Parkway WB ramps	Unsignalized	Does not exist			
27. Coffee Road/Westside Parkway EB ramps	Signal	Does not exist			
28. Coffee Road/Truxtun Avenue	Signal	E	67.2	F	81.2
29. Coffee Road/Stockdale Highway	Signal*	F	112.0	F	90.2
30. Mohawk Street/Rosedale Highway	Stop (existing)* Signal (future)*	F	62.4	F	53.2
31. Mohawk Street/WSP WB ramps	Signal	Does not exist			
32. Mohawk Street/WSP EB ramps	Signal	Does not exist			
33. Mohawk Street/Truxtun Avenue	Signal	C	29.0	D	41.5
34. Mohawk Street/California Avenue	Signal*	C	30.5	C	34.3
35. Stockdale Highway/California Avenue	Signal*	E	55.9	F	81.9
36. Airport Drive/State Road–SR 204 off-ramp	Signal	D	35.9	D	42.5
37. Airport Drive/SR 99 NB ramp	Signal	A	8.8	C	21.9
38. Buck Owens Boulevard/Rio Mirada Drive	Signal	D	43.7	B	17.8
39. SR 99 NB ramps/Buck Owens Boulevard	Signal	D	38.9	D	37.5
40. Rosedale Highway/Camino Del Rio Court	Signal	C	28.6	D	37.0
41. Rosedale Highway/SR 99 SB ramps	Signal	D	41.0	D	44.5
42. Rosedale Highway/SR99 NB ramps	Signal	D	50.9	F	125.6
43. 24th Street/Oak Street	Signal	F	89.4	F	100.3
44. Truxtun Avenue/Empire Drive	Signal*	N/A			
45. Truxtun Avenue/Oak Street	Signal	D	43.3	E	74.4
46. California Avenue/Chester Lane	Signal	B	17.5	C	27.8
47. California Avenue/SR 99 SB ramps	Signal	D	48.8	D	44.5
48. California Avenue/SR 99 NB ramps	Signal	E	74.8	C	25.1
49. California Avenue/Oak Street	Signal	D	44.1	E	78.7
50. Stockdale Highway/Stine Road	Signal*	N/A			

Table 2-5. Existing Conditions Intersection Level of Service Analysis (2 of 2)

INTERSECTION	SIGNAL CONTROL	YEAR 2038			
		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
51. Stockdale Highway/Real Road	Signal	F	95.8	F	93.2
52. Stockdale Highway/SR 99 SB ramp	Signal	B	12.2	B	10.5
53. Brundage Lane/Oak Street	Signal	C	28.9	D	38.8
54. Real Road/SR 58	Signal	C	27.0	C	27.3
55. Wible Road/SR 99 NB ramps	Signal	B	17.9	C	32.2
56. Ming Avenue/New Stine Road	Signal*	E	56.5	E	79.6
57. Ming Avenue/Real Road	Signal	C	25.4	E	60.8
58. Ming Avenue/SR 99 SB ramps	Signal	A	3.4	C	29.3
59. Ming Avenue/Wible Road	Signal	E	61.3	E	68.1
60. Ming Avenue/SR 99 NB ramps	Signal	C	26.7	D	40.4
61. Ming Avenue/Castro Lane	Signal	B	16.7	C	24.7
62. White Lane/Wible Road	Signal*	D	54.7	F	83.3
63. White Lane/SR 99 SB ramps	Signal*	C	22.3	F	109.5
64. White Lane/SR 99 NB ramps	Signal*	A	5.4	A	6.9
65. White Lane/Hughes Lane	Signal*	D	35.9	D	38.3
66. H Street/Brundage Lane	Signal	C	20.7	D	35.3
67. H Street/SR 58 WB ramp	Signal	B	17.1	E	56.3
68. H Street/SR 58 EB ramp	Signal	D	41.1	C	27.2
69. H Street/Ming Avenue	Signal*	C	29.6	D	35.5
70. Chester Avenue/Brundage Lane	Signal	C	21.0	C	30.7
71. Chester Avenue/SR 58 WB ramp	Signal	B	18.0	C	23.9
72. Chester Avenue/SR 58 EB ramp	Signal	C	28.9	C	22.2
73. Chester Avenue/Ming Avenue	Signal*	C	23.7	C	24.0
74. Union Avenue/Brundage Lane	Signal	D	42.1	D	39.6
75. Brundage Lane/SR 58 WB ramps	Signal	B	19.7	B	15.1
76. Union Avenue/SR 58 EB ramps	Signal	B	16.2	B	10.9
77. Cottonwood Road–MLK/Brundage Lane	Signal	N/A			
78. Cottonwood Road–Brundage Lane/SR 58 WB	Signal	N/A			
79. Cottonwood Road/SR 58 EB ramps	Signal	N/A			

\*LOS summary based on SYNCHRO 6

N/A Existing counts not available

Source: Fehr &amp; Peers Associates, Inc. (SYNCHRO 6 results)

Table 2-6. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions State Route 58 Eastbound

LOCATION	LANES	TYPE	AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY <sup>1</sup>	SPEED <sup>1</sup>	LOS	DENSITY <sup>1</sup>	SPEED <sup>1</sup>
SR 99 to H Street	3	Weave <sup>2</sup>	D	—	—	D	—	—
H Street off-ramp to Chester Ave on-ramp	2	Basic	D	29.0	63.5	D	27.0	64.3
Chester Avenue on-ramp	2	Merge	D	34.9	52.5	D	33.8	53.3
Chester Avenue to Union Avenue	2	Basic	D	34.3	60.3	D	33.7	60.7
Union Avenue off-ramp	2	Diverge	E	38.5	56.2	E	38.1	56.8
Union Avenue off-ramp to on-ramp	2	Basic	C	24.7	64.9	D	27.4	64.2
Union Avenue SB on-ramp	2	Merge	D	29.1	55.4	D	31.8	54.3
Union Avenue NB on-ramp	2	Merge	D	30.5	55.3	D	33.5	53.6
Union Avenue to Cottonwood Road	2	Basic	D	28.1	63.9	D	33.2	61.0

<sup>1</sup>Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.<sup>2</sup>Weave section analysis was performed using the Leisch Method, which does not provide density or speed estimates.

Source: Fehr &amp; Peers, 2010

**Table 2-7. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions  
State Route 58 Westbound**

LOCATION	LANES	TYPE	AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY <sup>1</sup>	SPEED <sup>1</sup>	LOS	DENSITY <sup>1</sup>	SPEED <sup>1</sup>
Cottonwood Road to Union Avenue	2	Basic	D	30.4	62.8	D	26.9	64.4
Brundage Lane off-ramp	2	Diverge	E	35.7	50.9	D	32.7	51.3
Brundage Lane off-ramp to on-ramp	2	Basic	C	24.8	64.9	C	23.6	65.0
Brundage Lane on-ramp	2	Merge	D	29.4	55.3	D	28.5	55.6
Union Avenue SB on-ramp	2	Merge	D	31.3	54.4	D	31.0	54.5
Chester Avenue off-ramp	2	Diverge	E	35.2	57.0	E	35.0	57.1
Chester Ave off-ramp to H Street on-ramp	2	Basic	C	24.7	64.9	C	24.8	64.9
H Street on-ramp	2	Merge	D	29.8	55.5	D	31.0	55.0
H Street to SR 99	2	Basic	D	27.9	64.0	D	29.4	63.3
SR 99 NB off-ramp	2	Diverge	D	33.6	58.2	D	34.8	58.4
SR 99 NB off-ramp to SB off-ramp	2	Basic	B	17.0	65.0	C	18.6	65.0
SR 99 SB off-ramp	2	Diverge	C	22.2	49.9	C	24.1	49.5

<sup>1</sup> Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.

Source: Fehr & Peers, 2010

**Table 2-8. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions  
State Route 99 Northbound**

LOCATION	LANES	TYPE	AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY <sup>1</sup>	SPEED <sup>1</sup>	LOS	DENSITY <sup>1</sup>	SPEED <sup>1</sup>
Panama Lane to White Lane	3	Basic	C	21.9	65.0	B	15.1	65.0
White Lane off-ramp	3	Diverge	C	27.3	61.2	C	21.0	60.8
White Lane off-ramp to on-ramp	3	Basic	C	20.6	65.0	B	13.1	65.0
White Lane EB on-ramp Loop	3	Merge	E	35.6	53.9	C	25.0	58.1
White Lane WB on-ramp	3	Merge	E	35.3	54.0	C	23.9	58.6
White Lane to Ming Avenue	3	Basic	D	34.9	59.8	C	21.5	65.0
Ming Avenue off-ramp	4	Diverge	C	27.6	59.4	C	20.4	59.6
Ming Avenue off-ramp to on-ramp	4	Basic	C	22.8	65.0	B	14.6	65.0
Ming Avenue on-ramp	4	Merge	D	31.2	57.3	C	24.0	59.5
SR 58 off-ramp	4	Diverge	E	40.6	61.4	D	30.0	62.4
SR 58 off-ramp to Wible Road on-ramp	4	Basic	C	21.0	65.0	B	13.6	65.0
Wible Road on-ramp	4	Merge	C	23.3	59.0	B	17.7	60.2
SR 58 on-ramp	4	Merge	D	31.1	57.4	C	24.8	59.4
SR 58 to California Avenue	4	Basic	D	28.8	63.6	C	20.9	65.0
California Avenue off-ramp	4	Diverge	E	36.7	60.9	C	27.0	62.4
California Avenue off-ramp to on-ramp	4	Basic	C	23.4	65.0	B	18.0	65.0
California Avenue EB on-ramp	4	Merge	C	25.3	58.5	C	22.2	59.4
California Avenue WB on-ramp	4	Merge	C	24.8	58.5	C	21.4	59.5
California Avenue to Rosedale Highway	4	Basic	D	26.5	64.5	C	22.1	65.0
Rosedale Highway off-ramp	4	Diverge	E	38.2	59.5	D	34.3	59.2
Buck Owens Boulevard off-ramp	4	Diverge	C	26.3	57.7	B	18.9	59.9

**Table 2-8. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions  
State Route 99 Northbound** *(continued)*

LOCATION	LANES	TYPE	AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY <sup>1</sup>	SPEED <sup>1</sup>	LOS	DENSITY <sup>1</sup>	SPEED <sup>1</sup>
Buck Owens Boulevard off-ramp to on-ramp	4	Basic	B	16.5	65.0	B	13.6	65.0
Buck Owens Boulevard on-ramp	4	Merge	B	18.6	60.0	B	17.8	60.2
Airport Drive off-ramp	4	Diverge	C	27.9	59.2	C	23.8	60.3
Airport Drive to Golden State Avenue	3	Basic	B	14.4	65.0	B	14.2	65.0

<sup>1</sup>Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.

Source: Fehr & Peers, 2010

**Table 2-9. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions  
State Route 99 Southbound**

LOCATION	LANES	TYPE	AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY <sup>1</sup>	SPEED <sup>1</sup>	LOS	DENSITY <sup>1</sup>	SPEED <sup>1</sup>
Golden State Avenue to Airport Drive	3	Basic	C	19.8	65.0	C	19.7	65.0
Airport Drive on-ramp	4	Merge	C	23.9	59.5	D	29.2	58.1
Airport Drive to Rosedale Highway	4	Basic	C	19.4	65.0	C	22.6	65.0
Rosedale Highway off-ramp	4	Diverge	C	25.4	62.6	D	28.5	62.4
Rosedale Highway off-ramp to on-ramp	4	Basic	B	16.7	65.0	C	19.7	65.0
Rosedale Highway WB on-ramp	4	Merge	C	21.9	59.5	D	28.9	57.9
Rosedale Highway EB on-ramp	4	Merge	C	25.9	58.9	D	32.4	56.6
Rosedale Highway to California Avenue	4	Basic	C	23.4	65.0	D	30.5	62.7
California Avenue off-ramp	4	Diverge	D	31.8	61.2	E	37.1	61.1
California Avenue off-ramp to on-ramp	4	Basic	C	18.7	65.0	C	25.2	64.8
California Avenue on-ramp	4	Merge	C	20.4	59.6	D	29.9	57.4
California Avenue to SR 58	4	Basic	C	20.0	65.0	D	29.4	63.3
SR 58 off-ramp	4	Diverge	D	31.0	61.9	F	—	—
SR 58 off-ramp to on-ramp	4	Basic	B	13.2	65.0	C	20.1	65.0
SR 58 on-ramp	4	Merge	C	20.5	59.8	C	27.3	58.2
Real Road on-ramp	4	Merge	B	18.3	60.1	C	24.6	58.6
Ming Avenue off-ramp	4	Diverge	C	24.7	62.1	E	36.2	60.0
Ming Avenue off-ramp to on-ramp	4	Basic	B	14.8	65.0	C	19.5	65.0
Ming Avenue on-ramp	3	Merge	C	22.0	58.9	D	29.3	57.0
Ming Avenue to White Lane	3	Basic	C	21.4	65.0	D	30.6	62.6
White Lane off-ramp	3	Diverge	B	15.1	59.1	C	24.7	57.3
White Lane off-ramp to on-ramp	3	Basic	B	13.5	65.0	B	17.7	65.0
White Lane WB on-ramp	3	Merge	B	16.1	59.6	C	20.1	58.9
White Lane EB on-ramp	3	Merge	B	16.2	59.8	C	20.0	59.2
White Lane to Panama Lane	3	Basic	B	14.7	65.0	C	19.1	65.0

<sup>1</sup>Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.

Source: Fehr & Peers, 2010

In addition, there are five study locations that operate at LOS E or F during at last one of the peak hours. They are as follows:

- White Lane eastbound on-ramp (AM peak hour)
- White Lane westbound on-ramp (AM peak hour)
- State Route 58 off-ramp (AM peak hour)
- California Avenue off-ramp (AM peak hour)
- Rosedale Highway off-ramp (AM peak hour)

The majority of the analysis locations on southbound State Route 99 operate at LOS C or better. The following locations operate at LOS D:

- Airport Drive on-ramp (PM peak hour)
- Rosedale Highway off-ramp (PM peak hour)
- Rosedale Highway westbound on-ramp (PM peak hour)
- Rosedale Highway eastbound on-ramp (PM peak hour)
- Rosedale Highway to California Avenue (PM peak hour)
- California Avenue off-ramp (AM peak hour)
- California Avenue on-ramp (PM peak hour)
- California Avenue to State Route 58 (PM peak hour)
- State Route 58 off-ramp (AM peak hour)
- Ming Avenue to White Lane (PM peak hour)

In addition, the PM peak hour has three locations with LOS E or LOS F conditions. The California Avenue off-ramp and the Ming Avenue off-ramp operate at LOS E. This condition is due to the high mainline and ramp volumes during the PM peak. The State Route 58 off-ramp operates at LOS F, as both the off-ramp volume and the mainline volume exceed their capacity in the two right lanes. According to PM peak hour field observations, slower free-flow periods were seen at the California Avenue off-ramp and the State Route 58 off-ramp. In addition, slower traffic was observed to be queued in the auxiliary lane at the White Lane off-ramp. This observation does not affect the analysis results, as the arterial operations on White Lane are the cause of the queues.

## **2.5 Summary of Existing Traffic Operational Conditions**

Figure 2-16 illustrates the locations of existing traffic congestion, based on AM or PM level of service grades of D, E or F. The degree of congestion is color coded on the map.

Level of service C or better is the standard adopted by Bakersfield and Kern County for locally owned facilities. Level of service D is the standard which Caltrans attempts to maintain for state routes within urbanized areas. Level of service E is a standard adopted by many of the largest metropolitan areas of the state, such as the Los Angeles and San Francisco Bay Area regions. Other San Joaquin Valley cities generally seek level of service D or better.

The intersections and freeway route segments addressed by this analysis are not all inclusive for the metropolitan Bakersfield area. Rather, these locations were selected for study as they may be impacted by one or more of the build alternatives analyzed for the Centennial Corridor project

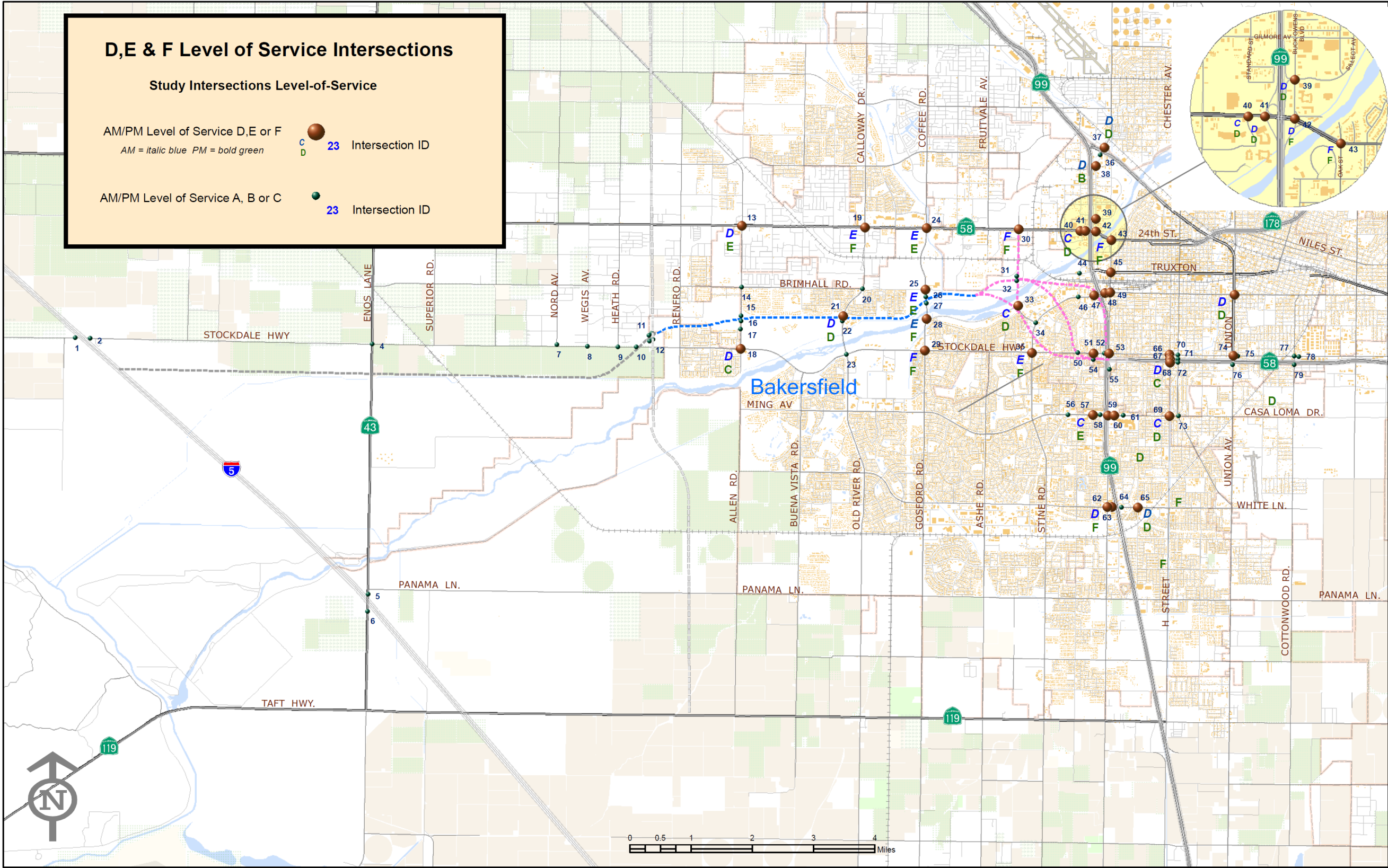


Figure 2-16: Locations of Existing Traffic Congestion

## **2.6 Truck Traffic in Metropolitan Bakersfield**

Approximately 5,000 heavy trucks move in an east–west direction through the Bakersfield area each day, causing congestion on state highways and local arterials. This section of the *Centennial Corridor Traffic Study* report examines existing truck traffic conditions in Bakersfield and Kern County, and explains how they are part of an overall freight movement system in the San Joaquin Valley and the state of California.

### ***Importance of Goods Movement in California, the San Joaquin Valley and Kern County***

The movement of goods in the state of California is one of the most vital aspects of continued economic development. As a result of California’s location on the West Coast, most of the goods and material flowing between Asia and North America must go through the state. Goods movement includes material that is distributed by trucks, ships, railroads, and airplanes.

Efficient freight transportation is also critical to the economic health of the Kern County region. As one of the prime agricultural regions in the nation, the intra-county road linkage of goods to processing plants, and the inter-county linkage of goods to other regions, manufacturers, and shipping ports are essential. Not only is Kern County a leading agricultural producer, it is also a prominent producer of oil and other minerals. These industries rely heavily on bulk movement by truck, rail and pipeline.

A key aspect of this goods movement is the travel through the San Joaquin Valley. The valley is the geographical and population center of the state. Almost every item that is trucked through California goes through the valley at some point in its journey. In addition to the pass-through goods movement, the San Joaquin Valley produces over one-half of the fresh fruits and vegetables grown in the United States. This fresh produce must move from the fields to consumers’ plates, requiring at least three trips to complete this journey.

Kern County is at the southern end of the San Joaquin Valley, strategically placed to provide convenient access to both the Los Angeles Basin and the San Francisco Bay Area. As a result, Kern County (and the San Joaquin Valley) is emerging as a significant regional center for distribution of goods and materials throughout the state and the country, providing service to coastal population centers as well as a growing internal population. In addition, the manufacturing and employment base of the San Joaquin Valley is increasing. All these factors contribute to increasing demand for freight transportation in Bakersfield and Kern County.

Trucking is the dominant mode of freight transport in Kern County, accounting for 87 percent of outbound tonnage and 81 percent of inbound tonnage (*San Joaquin Valley Goods Movement Study*, September 2000). Commodity movements by truck also indicate a strong relationship with the rest of the state with shipments to and from Southern California and the Bay Area, constituting the greatest percentage of total tonnage to and from the San Joaquin Valley (18 and 14 percent of the total, respectively).

Figure 2-17 illustrates commodity flows between Southern California (including Kern County) and its local, regional and national markets. The map shows freight movement that has an origin or destination in the Southern California region. The map shows the importance of goods movement throughout the length of the San Joaquin Valley to Southern California and the rest of the nation. East–west flow in this map travels predominantly along Interstates 10, 15 and 40.

Figure 2-18 illustrates commodity flows between the state of California and its local, regional and national markets. The map shows freight movement that has either an origin or destination in California and the rest of the United States. The map shows the emphasis on State Route 99 and Interstate 5 for San Joaquin Valley freight movements. It also shows the small number of potential routes from California to the rest of the nation as a result of the natural barrier created by the Sierra Nevada Mountains.

Understanding the patterns of truck traffic in the San Joaquin Valley is the first step in understanding truck traffic in Kern County. The San Joaquin Valley Regional Goods Movement Action Plan (2007) provides a comprehensive view of freight movement in the valley. The main factors influencing freight movement in the valley are as follows.

- Largest agricultural region in the world (more than \$20 billion in agricultural goods annually)
- Centralized location ideal for shipping and distribution facilities
- Prominent producer of oil and other minerals
- Widely dispersed cities with low densities located along State Route 99
- Numerous transportation systems including streets, highways, rail, ports and intermodal transfer facilities
- Limited east–west highways concentrate freight on a small number of state highways.

The following statistics indicate the significance of freight traffic in the valley.

- Truck traffic in Kern County accounts for 27 percent of the total traffic; in Stanislaus County, truck traffic is 19 percent of total traffic. The statewide average for truck volume is 9 percent by roadway segment.
- In 1992, truck vehicle miles traveled in the San Joaquin Valley accounted for 19 percent of all statewide vehicle miles traveled. This percentage grew to 28 percent by 2007 and continues to increase.
- From 1997 to 2003, truck traffic in the valley increased by 33 percent; statewide truck traffic only increased by 8 percent.
- Experts estimate that 25 to 30 percent of the truck traffic trips in the valley are through-trips of goods without an origin or destination in the valley.
- Interstate 5 has up to 30 percent trucks, depending on the location.
- Truck traffic on State Route 99 is 18 to 27 percent—two to three times the statewide average.

The east–west connectors are the most neglected part of the valley’s transportation network. The lack of an efficient east–west route through Bakersfield has caused a dispersed system of inadequate highways, which has strained the transportation network.

The San Joaquin Valley is one of four priority regions and corridors identified by the state of California.

1. Los Angeles/Inland Empire region
2. Central Valley region
3. San Diego/border region
4. San Francisco Bay Area region.

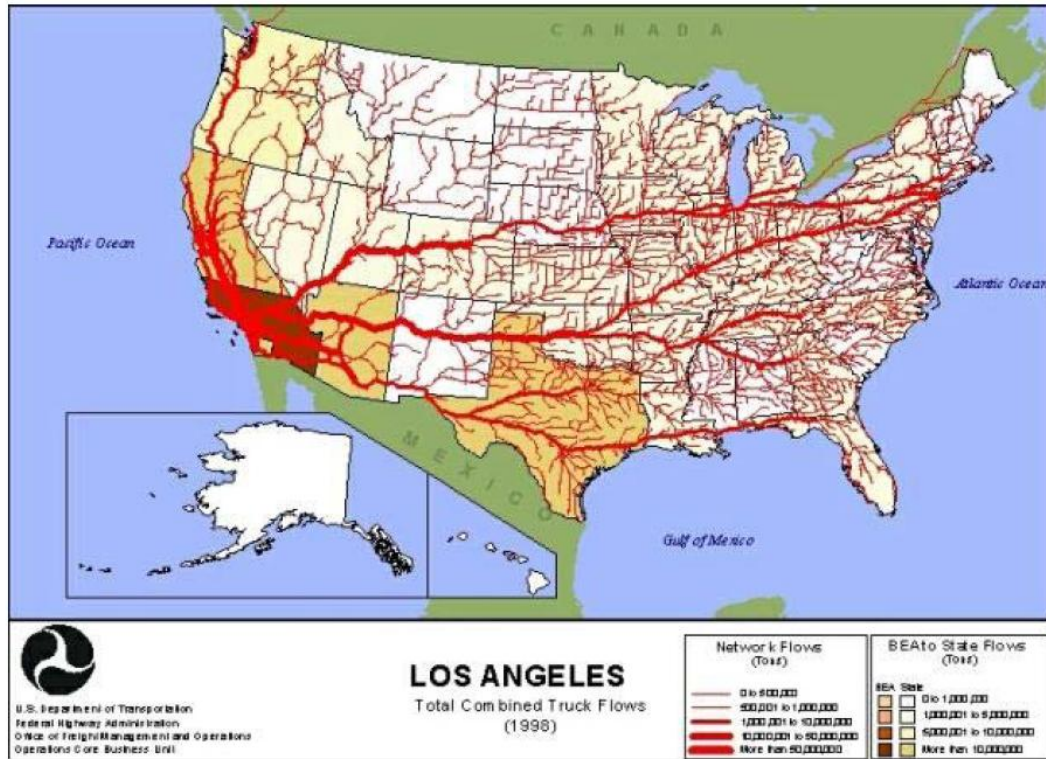


Figure 2-17: Los Angeles Total Combined Truck Flows—1998



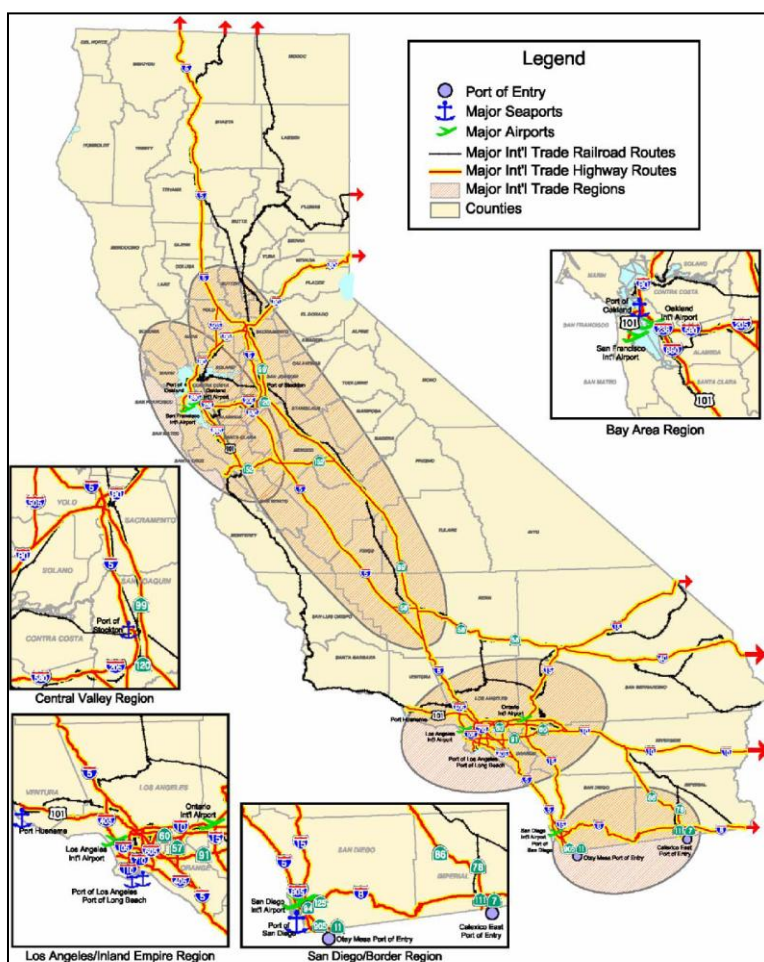
Figure 2-18: California Total Combined Truck Flows—1998

The map in Figure 2-19 illustrates these regions/corridors, which are identified in the *California Goods Movement Action Plan* (2005, 2007). The plan also contains a detailed list of projects that are proposed to improve the freight movement network in California.

### Freight Movement of Agricultural Products

Freight movement consists of three distinct markets:

1. Regional and local distribution
2. Domestic trade and national distribution
3. International trade.



Source: *California Goods Movement Action Plan* (2007)

**Figure 2-19: Priority Regions and Corridors**

Crops growing in the fields require a substantial number of trips before they arrive on our plates for consumption. Agricultural activities generate three phases of collection and distribution.

- Agricultural field to preparation facility
- Preparation facility to distribution facility
- Distribution facility to market.

Kern County ranks fourth in the state with an annual agricultural production value of \$3.6 billion. Six of the top seven agricultural counties in the state of California are in the San Joaquin Valley, producing \$19.8 billion of agricultural products in 2009. Table 2-10 lists the top 10 agricultural counties for 2008 and 2009, with the crop value and leading commodities. Table 2-11 lists the top 20 agricultural commodities in Kern County for 2009.

Agricultural crops occupy a large amount of land in Kern County. Figure 2-20 illustrates the types of agricultural land in the valley section of Kern County: cereals, orchards, rangeland/pasture, row crops and uncultivated agricultural land. Most of the land in this area is used for some type of agriculture.

**Table 2-10. Top 10 California Agricultural Counties for 2008 and 2009**  
(with Crop Value and Leading Commodities)

RANK		COUNTY	TOTAL VALUE (thousands)	LEADING COMMODITIES
2008	2009			
1	1	Fresno	5,372,009	Grapes, tomatoes, poultry, almonds, cattle and calves
2	2	Tulare	4,046,355	Milk, oranges, grapes, cattle and calves, corn
4	3	Monterey	4,033,718	Lettuce, strawberries, nursery, broccoli, grapes
3	4	Kern	3,606,356	Grapes, milk, vegetables, almonds, pistachios
5	5	Merced	2,460,474	Milk, chickens, almonds, cattle and calves, sweet potatoes
6	6	Stanislaus	2,310,071	Milk, almonds, chickens, cattle and calves, tomatoes
7	7	San Joaquin	2,000,474	Grapes, milk, cherries, tomatoes, walnuts
10	8	Ventura	1,621,575	Strawberries, nursery stock, celery, raspberries, lemons
11	9	San Diego	1,548,124	Woody ornamentals, flowers and foliage, bedding plants, avocados, tomatoes
9	10	Imperial	1,452,970	Lettuce, cattle, wheat, alfalfa, broccoli

**Table 2-11. Kern County Top 20 Agricultural Commodities (Year 2009)**

RANK	COMMODITY	VALUE (\$)
1	Grapes—all	664,499,000
2	Milk—market and manufacturing	437,610,000
3	Almonds, including by-products	435,305,000
4	Carrots—fresh and processing	343,128,000
5	Citrus—all	332,926,000
6	Pistachios	331,120,000
7	Cattle and calves	174,216,000
8	Hay, alfalfa	106,144,000
9	Pomegranate—fresh and processing	99,018,000
10	Potatoes, all	99,926,000
11	Cotton, including processed cottonseed	63,206,000
12.	Tomatoes—fresh and processing	59,045,000
13	Silage and forage	46,001,000
14	Apiary products	41,423,000
15	Eggs	30,102,000
16	Bell pepper—fresh and processing	28,844,000
17	Wheat	27,837,000
18	Nursery fruit, nut trees and vines	27,457,000
19	Roses	27,201,000
20	Onions	26,437,000

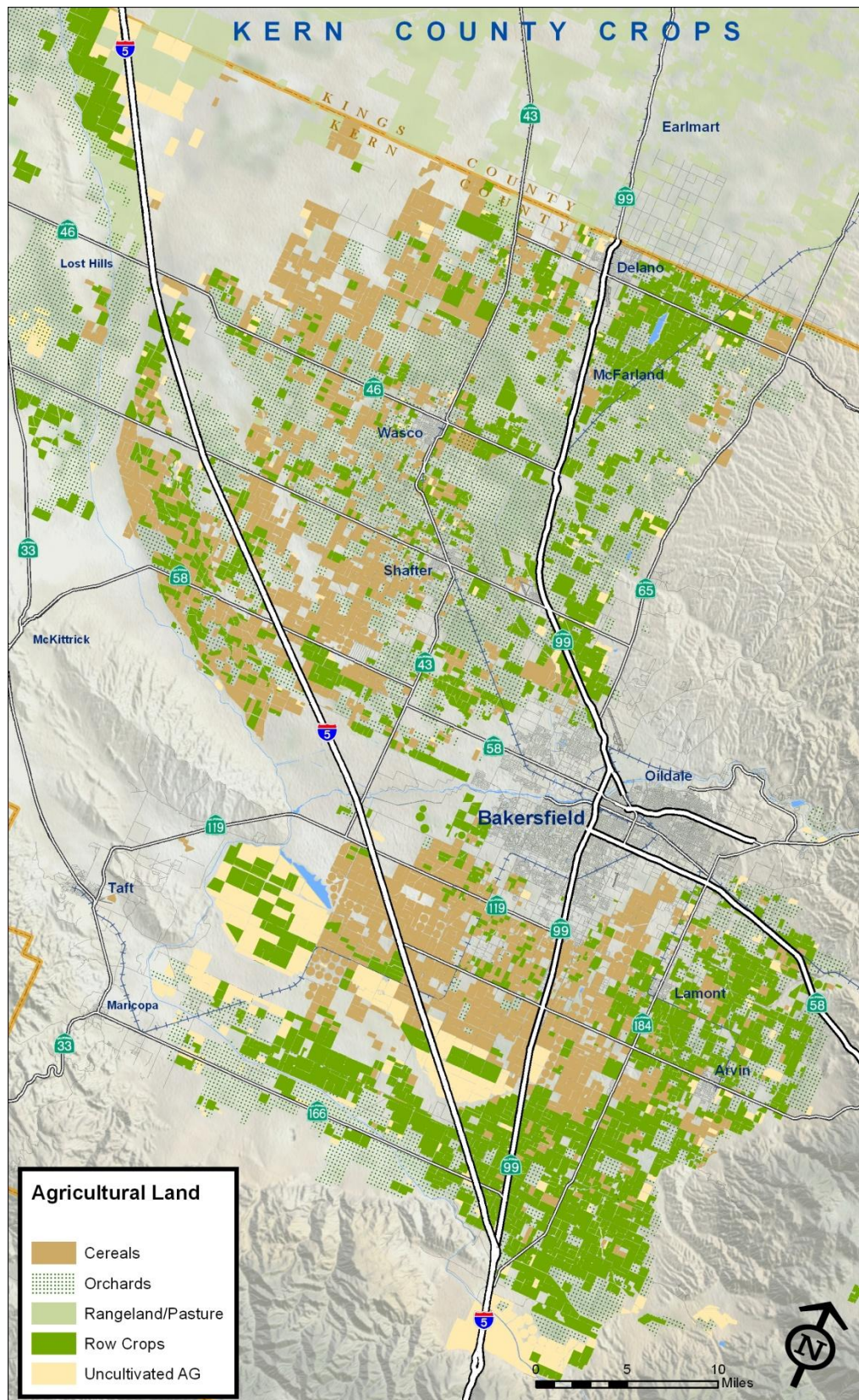
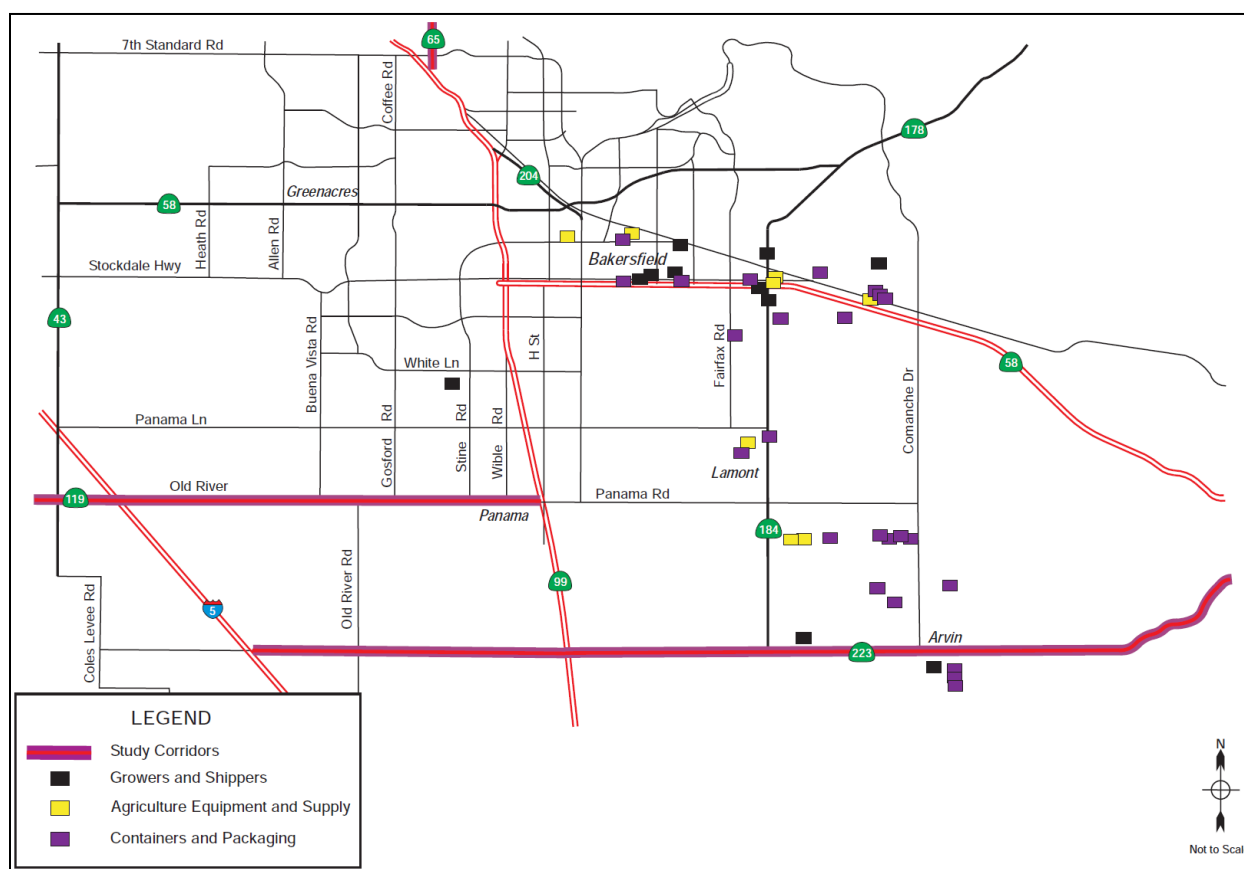


Figure 2-20: Types of Agricultural Land in Kern County

## Agricultural Business and Distribution Facilities

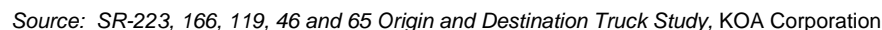
Agricultural distribution facilities play an important part in determining the volume of truck traffic. One task of a series of truck origin and destination studies that the KOA Corporation completed under contract to the Kern Council of Governments was to locate the agricultural businesses and distribution facilities in the Bakersfield area. As Figure 2-21 shows, all of the agricultural businesses are located east of State Route 99, and most are located adjacent to State Route 58. There are also a number of facilities located adjacent to State Route 119 and State Route 184. These state highways provide an essential network for the collection and distribution of agricultural commodities. The substantial number of these facilities indicates the high intensity of freight traffic near the State Route 58 and State Route 99 interchange.



Source: SR-223 166, 119, 46 and 65 Origin and Destination Truck Study, KOA Corporation

**Figure 2-21: Agricultural Business Locations near Bakersfield**

The locations of distribution and supply facilities are shown on Figure 2-22. These facilities are used heavily by heavy trucks to distribute goods and materials within Kern County and beyond. The heavy concentration of these facilities along State Route 58 and State Route 99 indicates the importance of the state highway and local roadway network in providing access to these distribution hubs.



**Figure 2-22: Distribution and Supply Locations near Bakersfield**

### ***Current Freight Movement Data, Studies, Reports for Kern County***

Over the past ten years, a number of agencies have taken the initiative to study and better understand truck movement in the region. The State of California, regional transportation agencies in the San Joaquin Valley and the Kern Council of Governments have completed more than 20 truck travel and mobility studies which provide information and data that pertain to the current understanding of the issue. The identified studies either provide data for the project study area or provide valuable concepts related to goods movement or lessons learned from other areas. In general, the studies provide historical and statistical information that include goods movement trends, traffic counts, level of service, and planned roadway improvements to assist in gaining a better understanding of goods movement in the region.

Since 2009, the Kern Council of Governments, in cooperation with other San Joaquin Valley regional transportation planning agencies and Caltrans, has sponsored and administered three truck origin and destination studies in and around Kern County. All three studies were conducted by KOA Corporation and their purposes are summarized below.

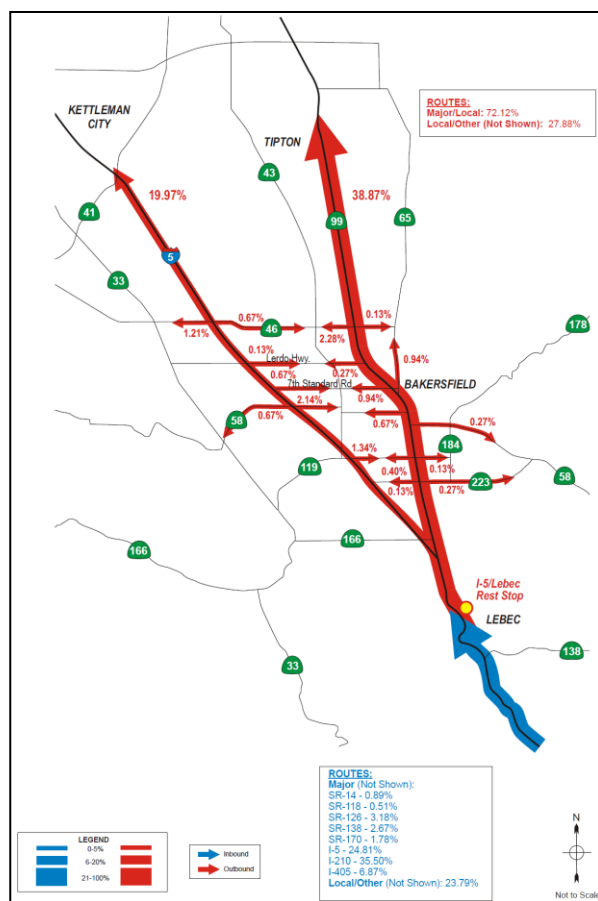
### ***I-5/SR-99 Origin and Destination Truck Study***

Kern COG and Caltrans, October 2009

The purpose of the study was to gain statistical information on the origin and destination of trucks traveling along Interstate 5/State Route 99 within Kern County. The study contributes to a better understanding of the directional truck distribution and types of cargo being transported in

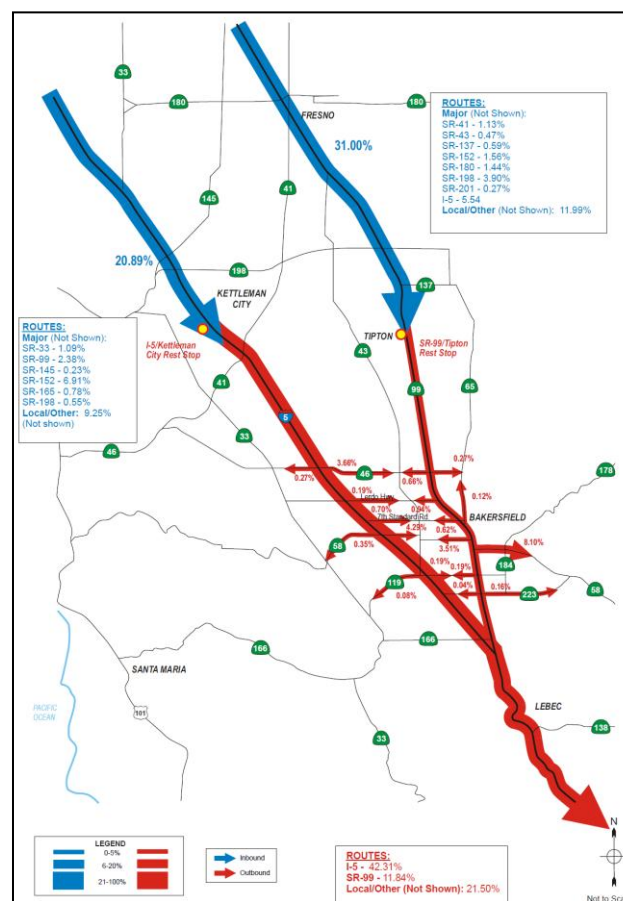
the region for use in future planning efforts. There were three major data collection tasks involved in the project: vehicle classification counts, truck intercept surveys, and commercial fleet operator surveys during the fall and spring seasons. The project findings helped to define truck distribution patterns along Interstate 5/State Route 99 from a seasonal standpoint through the surveys and truck volume data collected. The following provides a brief description of the key findings.

- The study surveyed the different types of trucks along the Interstate 5/State Route 99 corridors. The majority of trucks (83.8 percent) are the five-axle, double-unit type.
- The study surveyed the geographic location where the trucks are based. The results showed that 70 percent were based within California, with the remaining 30 percent based in other states. Of those trucks based in California, 47 percent were based in the San Joaquin Valley region and 34 percent were based in the Southern California region.
- The survey results indicated that 83.4 percent of trucks traveling on northbound Interstate 5/State Route 99 started their trip within California and 16.6 percent started their trip from other states. Of the total trips, 49.7 percent started their trip within the Southern California region, followed by the San Joaquin Valley region at 29.8 percent.
- The survey results indicated that 15.3 percent of trucks traveling on southbound Interstate 5/State Route 99 started their trip outside of California and 84.7 percent within California. Of the total trips that originated within California, 59.2 percent started from the San Joaquin Valley region, 12.7 percent started from the Bay Area and 8.3 percent started from Greater Sacramento region.
- The results indicated that in the northbound direction (Lebec rest stop), 24.8 percent of truck drivers accessed via Interstate 5 north, 35.5 percent via Interstate 210 west and 6.9 percent via Interstate 405 north. The results indicated that in the northbound direction, the predominant route used to reach the final destination was State Route 99 north followed by Interstate 5 north. Figure 2-23 summarizes the northbound route choice pattern at the Lebec rest stop.
- The results indicated that in the southbound direction (Lebec rest stop), 15.7 percent of truck drivers accessed via Interstate 5 south and 51.4 percent via State Route 99 south. The results also indicated that in the southbound direction, Interstate 5 south was the predominate route of choice by truck drivers; and from Interstate 5, the majority route choice was split between Interstate 210 east and Interstate 405 south. Figure 2-24 summarizes the southbound route choice pattern at the Lebec rest stop.
- Truck operations are mostly local and regional. Fleets based in Kern County primarily serve Kern County origins and destinations.
- Trucks use State Route 99 much more often than Interstate 5 because origins and destinations cluster along State Route 99. Every Kern County private fleet operator interviewed was located east of Interstate 5.
- Trucks tend to use Interstate 5 to connect Kern County points with regions to the north and south (e.g., the Bay Area or the Los Angeles Basin).
- Regional trips place a burden on east–west connectors such as State Route 166, State Route 58, and State Route 46. For local trips, private fleets often use arterials or frontage roads in preference to freeways.



Source: I-5/SR-99 Origin and Destination Study, KOA Corporation

**Figure 2-23: Northbound Route Choice (Lebec Rest Stop)**



**Figure 2-24: Southbound Route Choice (Kettleman City/Tipton Rest Stop)**

### SR-58 Origin and Destination Truck Study

SANBAG, Kern COG, and Caltrans District 6, 8, 9, and Headquarters, February 2009

The purpose of the study was to gain statistical information on the origin and destination of trucks traveling along State Route 58 in San Bernardino and Kern counties. The study helps provide a better understanding of the directional truck distribution and types of cargo being transported in the region for use in future planning efforts. The project tasks included literature review, vehicle classification counts, truck intercept surveys, and commercial fleet operator surveys during the fall and spring seasons. The study provided insight into seasonal truck goods movement patterns and truck volume data along State Route 58. The following provides a brief description of key study findings.

- Truck traffic along the State Route 58 Corridor is generally heaviest near the State Route 99 interchanges within Bakersfield. This is likely due to the presence of local trucks as well as regional trucks traversing the corridor and also the presence of truck-related land uses within Bakersfield.
- Between State Route 99 and Interstate 15, truck traffic makes up a relatively large percentage of total traffic. Vehicle classification count results show truck percentages range between 30 and 40 percent, depending on the segment. This is likely due to the low volume of passenger vehicles utilizing this segment of the corridor.

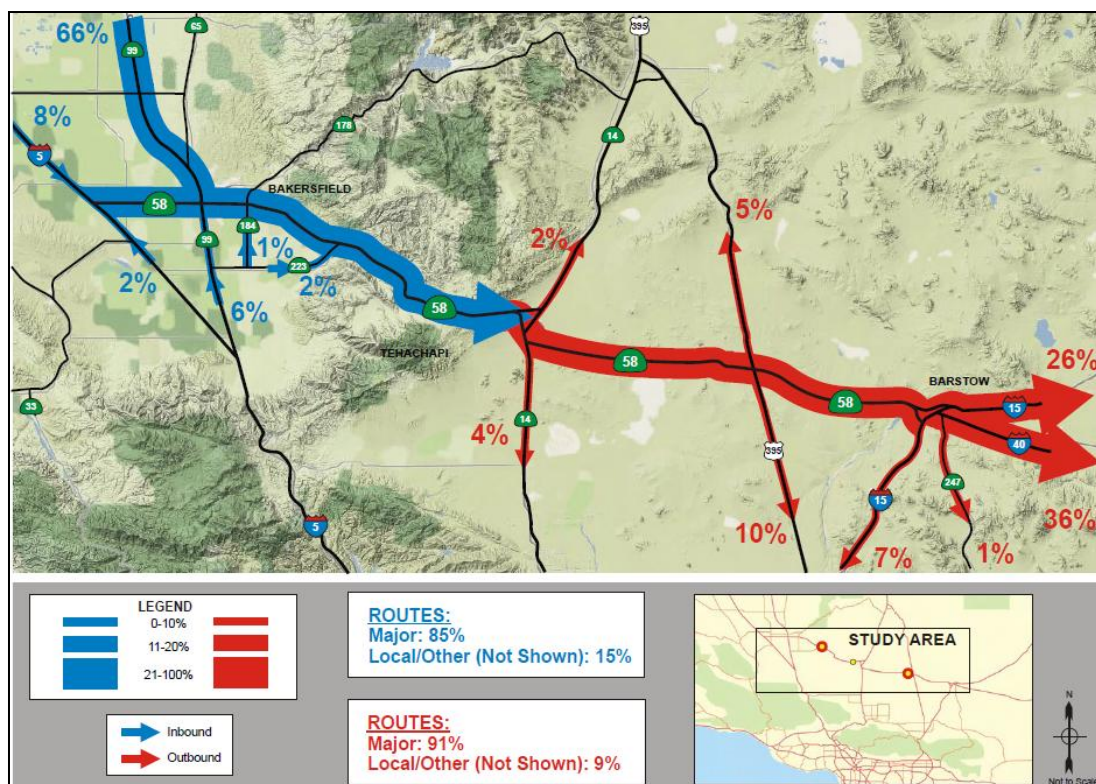
- The study surveyed the geographic location where the trucks are based. The results showed that 44 percent were based within California, with the remaining 56 percent based in other states. Of those trucks based in California, 57 percent were based in the San Joaquin Valley region and 32 percent were based in the Southern California region.
- The survey results indicated that of the total number of eastbound trucks, the majority (66 percent) used southbound State Route 99 to access State Route 58. This is consistent with the survey results which indicated that most of the trip origins were from the San Joaquin Valley and Central Coast regions. As the eastbound truck trips left the State Route 58 Corridor, the majority used eastbound Interstate 15 (26 percent) and Interstate 40 (36 percent). This pattern is also consistent with survey results which indicated that 66 percent of eastbound trips were bound for locations outside of California. The survey respondents also indicated that their route choice was based primarily on the shortest/fastest route. Figure 2-25 summarizes the eastbound route choice pattern.
- The survey results indicated that of the total number of westbound trucks, the majority used westbound Interstate 15 (26 percent) and Interstate 40 (41 percent) to access State Route 58. This is consistent with the survey results which indicated that 63 percent of westbound truck trips originated from outside of California. As the westbound trips left the State Route 58 Corridor, the majority used northbound State Route 99 (73 percent). This is also consistent with the survey results which indicated that the majority of truck trips were bound for regions located north of the State Route 58 Corridor. The survey respondents also indicated that their route choice was based primarily on the shortest/fastest route. Figure 2-26 summarizes the westbound route choice pattern.

### ***SR-223, 166, 119, 46 and 65 Truck Origin and Destination Study***

(Kern COG and Caltrans, January 2011)

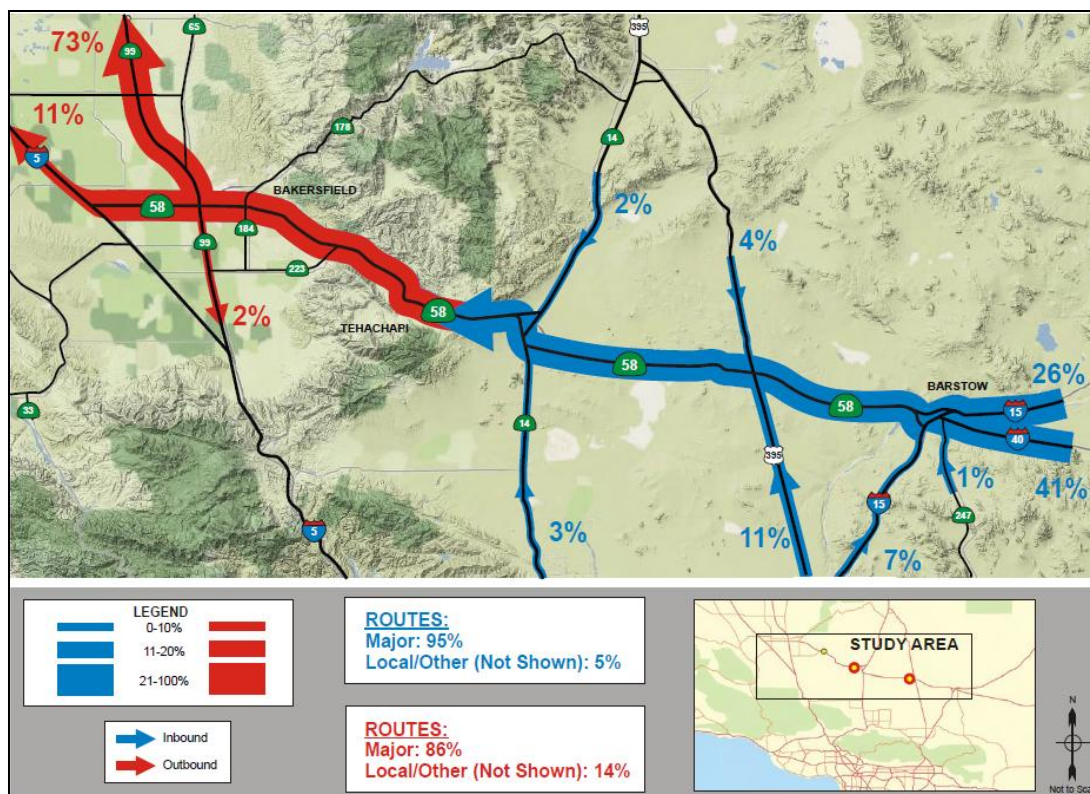
The objective of this truck study was to gain statistical information on the origin and destination of trucks traveling through Kern County on the study routes, and to better understand the types of cargo being transported by trucks. These study corridors are primarily the rural, east-west routes that serve as interregional connectors within the county. The following provides a brief description of findings.

- Of the five study routes, State Route 46 had the highest truck traffic based on the 24-hour counts and peak-period counts conducted on the route. Truck traffic along the State Route 46 corridor is generally heaviest near the Interstate 5 interchange within Lost Hills. This is likely due to the accessibility to the coast on the west and lack of significant curvilinear features of the roadway, as compared to the other study routes that have a significant number of curved segments.
- State Route 46 volumes generally had a higher proportion of trucks. Additional routes with higher truck proportions included State Route 223, State Route 166, and State Route 65. Although the total truck volumes were not as high as State Route 46 (which ranged from approximately 20 to 60 percent) on these routes, the average percentage of trucks ranged from approximately 20 to 30 percent. This is significantly higher than typical roadways, where truck volumes proportions are usually less than five percent.
- The majority of trucks (44.60 percent) were five-axle, double-unit types and the next most common were two-axle (27.16 percent) types.



Source: SR-58 Origin and Destination Truck Study, KOA Corporation

**Figure 2-25: Eastbound Route Pattern on State Route 58 Corridor**



Source: SR-58 Origin and Destination Truck Study, KOA Corporation

**Figure 2-26: Westbound Route Pattern on State Route 58 Corridor**

- Of the freight truck types identified, the majority of the truck types fell into two categories—van or hopper. The largest proportion of truck equipment types were within the freight category at 77.24 percent. The service/work category included 21.60 percent of the trucks.
- For specific freight truck types, the van and hopper were the predominant truck types observed. Overall, the van truck types had the highest proportion of trucks at 39 percent. This was followed by the hopper truck types with 26.76 percent.
- The agribusinesses surveyed tended to be clustered east of Bakersfield. The more general purpose equipment, supply, warehouse, and distribution businesses tended to be more evenly distributed across the region.
- For national trucking companies, the study routes are not normally used as trucking routes. The study routes have a higher use by local trucking companies. While they are used by regional and national carriers, central office operations staff know relatively little about the specifics of their operation using these routes unless they know of a specific movement that probably uses the route or a specific customer on or near the route.
- Truckers that primarily use the north–south routes (Interstate 5 and State Route 99) and are based beyond the study area (particularly the Los Angeles and Central Valley areas) tend to use these five routes only if they have a customer on one of the routes
- Truckers that access State Route 58 to the east primarily traverse Kern County (without stopping at local industries) and prefer to use State Route 58 when east of Bakersfield and State Route 46 when west of Kern County.
- When traveling beyond Bakersfield to either the coastal counties or points north of Kern County, truckers will use Interstate 5 or State Route 99.
- State Route 223 is often viewed as “the way to go to avoid State Route 99 at its junction with State Route 58 just south of downtown Bakersfield, particularly at rush hour” by truckers that traverse the area.
- State Route 119 and State Route 166 have large amounts of traffic related to petroleum production, which is a major component of the Taft and Maricopa area economies.
- There was relatively less agricultural traffic reported on State Route 119. The area around Taft is rather arid and much more dominated by petroleum than the rest of Kern County.
- State Route 223 is the primary route from Lamont, Arvin and Edison either to State Route 99 heading south or to State Route 58 heading east.

### ***Truck Volumes on State Routes***

Table 2-12 summarizes daily truck traffic volumes on state highways compiled by Caltrans’ Division of Traffic Operations, Office of System Planning Management Traffic Data Branch for the year 2009. Annual average daily truck traffic is shown for selected locations state highways that have an east–west orientation. Truck traffic is classified by number of axles. The two-axle class includes 1½-ton trucks with dual rear tires and excludes pickups and vans with only four tires. Total vehicle annual average daily traffic (AADT) for the same year is taken from the Traffic Volumes on California State Highways booklet published by the California Department of Transportation.

Table 2-12. State Route Truck Counts (Year 2009)

ROUTE	POSTMILE	LEG	AADT TOTAL	TOTAL TRUCKS	TOTAL TRUCKS %	2-AXLE		3-AXLE		4-AXLE		2, 3, 4- AXLE VOLUME	5-AXLE		DESCRIPTION	YEAR VERIFIED/ ESTIMATED
						VOLUME	%	VOLUME	%	VOLUME	%		VOLUME	%		
5	0	O	69,000	16,360	23.71	3,833	23.43	636	3.89	366	2.24	4,835	11,522	70.43	Los Angeles/Kern County Line	09E
5	15.858	A	28,000	6,770	24.18	1,474	21.77	294	4.33	194	2.87	1,962	4,808	71.03	Junction Route 99 North	08E
5	15.858	B	72,000	17,410	24.18	3,494	20.07	770	4.42	486	2.79	4,750	12,660	72.72	Junction Route 99 North	08V
5	19.612	A	29,500	7,133	24.18	1,553	21.77	309	4.33	205	2.87	2,067	5,067	71.03	Junction Route 166	08E
5	38.793	A	25,000	5,443	21.77	1,185	21.77	236	4.33	156	2.87	1,577	3,866	71.03	Junction Route 119	07E
5	38.793	B	30,000	6,531	21.77	1,422	21.77	283	4.33	187	2.87	1,892	4,639	71.03	Junction Route 119	07E
5	41.193	A	27,000	5,878	21.77	1,280	21.77	255	4.33	169	2.87	1,704	4,175	71.03	Junction Route 43	07E
5	41.193	B	25,000	6,123	24.49	1,333	21.77	265	4.33	176	2.87	1,774	4,349	71.03	Junction Route 43	07E
5	52.145	A	29,000	8,831	30.45	1,545	17.5	265	3	177	2	1,987	6,844	77.5	Junction Route 58	05E
5	52.145	B	32,000	9,699	30.31	1,800	18.56	250	2.58	150	1.55	2,200	7,499	77.32	Junction Route 58	06E
5	73.017	A	31,000	9,883	31.88	1,384	14	593	6	296	3	2,273	7,610	77	Junction Route 46	05E
5	73.017	B	29,000	9,126	31.47	1,278	14	548	6	274	3	2,100	7,027	77	Junction Route 46	05E
46	20.543	A	10,500	1,986	18.91	713	35.88	79	3.99	52	2.64	844	1,142	57.49	Blackwells Corner, Junction Route 33	07E
46	20.543	B	10,500	1,986	18.91	713	35.88	79	3.99	52	2.64	844	1,142	57.49	Blackwells Corner, Junction Route 33	07V
46	32.533	A	6,100	2,379	39	404	17	167	7	95	4	666	1,713	72	Junction Route 5	03V
46	32.533	B	10,000	2,805	28.05	964	34.35	114	4.07	70	2.51	1,148	1,657	59.07	Junction Route 5	08V
46	50.904	B	8,900	3,026	34	878	29	91	3	91	3	1,060	1,967	65	Wasco, Junction Route 43 South	03E
46	51.215	A	9,600	3,264	34	947	29	98	3	98	3	1,143	2,122	65	Wasco, Junction Route 43 North	04E
46	57.785	B	7,700	3,080	40	893	29	92	3	92	3	1,077	2,002	65	Famoso, Junction Route 99	04E
58	15.41	B	300	69	23	47	68	9	13	2	3	58	11	16	Junction Route 33	03E
58	15.42	A	1,250	296	23.66	135	45.45	40	13.64	13	4.55	188	108	36.36	Junction Route 33	06V
58	23.748	A	7,000	2,240	32	1,389	62	112	5	67	3	1,568	672	30	Lokern Road	03E
58	39.96	B	6,200	1,275	20.56	517	40.54	189	14.86	52	4.05	758	517	40.54	Junction Route 43	06V
58	39.97	A	6,900	1,725	25	1,052	61	121	7	69	4	1,242	483	28	Junction Route 43	03E
58	46.1	A	28,000	7,280	26	4,950	68	510	7	291	4	5,751	1,529	21	Allen Road	03E
58	46.1	B	21,000	4,830	23	2,946	61	338	7	193	4	3,477	1,352	28	Allen Road	03E
58	51.807	B	49,500	10,890	22	7,405	68	762	7	436	4	8,603	2,287	21	Bakersfield, Real Road	03E
58	52.36	A	68,000	14,960	22	4,189	28	2,842	19	1,197	8	8,228	6,732	45	Bakersfield, South Junction Route 99	03E
58	55.404	A	65,000	16,250	25	4,875	30	1,788	11	1,625	10	8,288	7,963	49	Cottonwood Road	03E
58	59.44	A	25,000	7,845	31.38	2,224	28.35	446	5.69	156	1.99	2,826	5,019	63.98	Junction Route 184	07E
58	75.63	A	19,500	6,119	31.38	1,734	28.33	348	5.69	122	1.99	2,204	3,915	63.98	Junction Route 223	07E
58	75.63	B	19,000	5,962	31.38	1,690	28.35	339	5.69	119	1.99	2,148	3,814	63.98	Junction Route 223	07V
58	90.717	A	20,900	6,558	31.38	1,858	28.33	373	5.69	131	1.99	2,362	4,196	63.98	Junction Route 202 Southwest	07E
58	90.717	B	21,200	6,653	31.38	1,885	28.33	379	5.69	132	1.99	2,396	4,257	63.98	Junction Route 202 Southwest	07E

Table 2-12. State Route Truck Counts (Year 2009)

ROUTE	POSTMILE	LEG	AADT TOTAL	TOTAL TRUCKS	TOTAL TRUCKS %	2-AXLE		3-AXLE		4-AXLE		2, 3, 4- AXLE VOLUME	5-AXLE		DESCRIPTION	YEAR VERIFIED/ ESTIMATED
						VOLUME	%	VOLUME	%	VOLUME	%		VOLUME	%		
58	107.46	B	19,300	6,508	33.72	352	5.41	528	8.11	444	6.83	1,324	5,184	79.66	Randsburg Cut-Off Road	06V
58	111.13	B	14,050	4,918	35	738	15	98	2	49	1	885	4,033	82	Junction Route 14	03E
58	127.63	A	17,000	6,290	37	944	15	126	2	63	1	1,133	5,158	82	California City Boulevard	03E
99	0.748	A	44,000	11,000	25	1,650	15	660	6	330	3	2,640	8,360	76	Junction Route 5	05E
99	2.732	A	45,000	11,250	25	1,800	16	450	4	338	3	2,588	8,663	77	Mettler, Junction Route 166 West	05E
99	13.411	B	47,000	11,750	25	1,880	16	588	5	353	3	2,821	8,930	76	Junction Route 223 East	05E
99	17.5	B	54,500	13,205	24.23	3,415	25.86	647	4.9	272	2.06	4,334	8,871	67.18	Junction Route 119 West	05V
99	22.604	B	114,000	11,309	9.92	3,177	28.09	623	5.51	301	2.66	4,101	7,208	63.74	Bakersfield, Ming Avenue Interchange	08V
99	25.654	A	100,000	27,500	27.5	6,600	24	1,375	5	550	2	8,525	18,975	69	Junction Route 58 West, Junction Route 178 East	05E
99	25.654	B	132,000	27,720	21	6,930	25	1,386	5	832	3	9,148	18,572	67	Junction Route 58 West, Junction Route 178 East	05E
99	29.878	A	61,000	18,300	30	2,928	16	732	4	549	3	4,209	14,091	77	Junction Route 65	04E
99	29.878	B	78,000	23,400	30	3,744	16	936	4	702	3	5,382	18,018	77	Junction Route 65	04E
99	44.307	A	51,000	13,770	27	2,203	16	551	4	413	3	3,167	10,603	77	Junction Route 46	04E
99	44.307	B	57,000	15,960	28	2,713	17	1,436	9	958	6	5,107	10,853	68	Junction Route 46	03V
99	55.521	A	47,000	13,160	28	2,500	19	658	5	395	3	3,553	9,607	73	Delano, Junction Route 155	04E
99	55.521	B	53,000	14,840	28	2,820	19	1,929	13	445	3	5,194	9,646	65	Delano, Junction Route 155	04E
119	0	A	5,100	969	19	523	54	48	5	19	2	590	378	39	Taft, Junction Route 33	04E
119	2.14	A	7,600	1,672	22	920	55	167	10	84	5	1,171	502	30	Harrison Street	04E
119	2.14	B	5,000	1,100	22	605	55	110	10	55	5	770	330	30	Harrison Street	04E
119	18.173	B	10,600	2,332	22	1,632	70	140	6	70	3	1,842	490	21	Junction Route 43 North	04E
119	18.173	A	10,000	2,000	20	1,260	63	160	8	60	3	1,480	520	26	Junction Route 43 North	04E
119	19.773	B	10,000	1,988	19.88	1,473	74.09	220	11.05	92	4.61	1,785	204	10.25	Junction Route 5	08V
119	19.773	A	6,800	2,012	29.59	1,304	64.81	149	7.41	93	4.63	1,546	466	23.15	Junction Route 5	06E
119	31.283	B	12,500	2,625	21	1,680	64	131	5	53	2	1,864	761	29	Junction Route 99	04E
223	1.85	A	1,200	228	19	73	32	9	4	11	5	93	135	59	Junction Route 5	03E
223	10.536	B	4,700	893	19	277	31	45	5	54	6	376	518	58	Junction Route 99	03E
223	10.536	A	6,900	1,435	20.8	276	19.23	193	13.46	138	9.62	607	828	57.69	Junction Route 99	03V
223	16.014	B	6,600	1,848	28	739	40	314	17	111	6	1,164	684	37	Junction Route 184 North	03E
223	16.014	A	7,000	1,750	25	858	49	158	9	105	6	1,121	630	36	Junction Route 184 North	03E
223	20.15	B	7,200	936	13	365	39	103	11	19	2	487	449	48	Arvin, Comanche Drive	03E
223	20.15	A	10,000	1,000	10	400	40	70	7	20	2	490	510	51	Arvin, Comanche Drive	03E
223	31.92	B	1,150	441	38.33	77	17.39	48	10.87	29	6.52	154	288	65.22	Junction Route 58	06V

Source: State of California Business, Transportation and Housing Agency, Department of Transportation, Division of Traffic Operations, "2009 Annual Average Daily Truck Traffic on the California State Highway System," December 2010.

Annual average daily truck traffic is the total truck traffic volume divided by 365 days. Truck counting is done throughout the state in a program of continuous truck count sampling. The sampling includes a partial day, 24-hour, seven-day and continuous vehicle classification counts. The partial day and 24-hour counts are usually made on high volume, urban highways. The seven-day counts are made on low volume, rural highways. The counts are usually taken only once in the year. About one-sixth of the locations are counted annually. The resulting counts are adjusted to an estimate of annual average daily truck traffic by compensating for seasonal influence, weekly variation, and other variables that may be present.

The columns in Table 2-12 entitled "Year" and "Verified/Estimated" represent the year the truck percentages were verified (counted continuously or quarterly) or estimated. Selected points on a route are typically counted and the ones in between are estimated.

Each count location is identified by the post mile value corresponding to that point on the highway. The post mile values increase from the beginning of a route within a county to the next county line. The post mile values start over again at each county line. Post mile values increase usually from south to north or west to east depending on the general direction the route follows within the state. For State Route 99, the post miles run from south to north. The counts located nearest the Golden State Avenue interchange are highlighted in blue.

A leg is given for each count location and is denoted by an A (ahead leg), B (behind leg) or O (traffic volume is equal for the ahead and back legs). For traffic volumes purposes, a highway intersection or interchange has two legs. According to ascending post miles (route direction) and a post mile reference at the center of the intersection or interchange, B = back leg, A = ahead leg, and O = traffic volume is equal for the back and ahead legs.

Truck AADTs are shown as two-way traffic. Figure 2-27 illustrates the vehicle types included under each two-axle (Classes 4 and 5), three-axle (Class 6 and 50 percent of Class 8), four-axle (Class 7 and 50 percent of Class 8), and five-axle (Classes 9 through 13) count.

Relative to other state highway facilities in Kern County, truck volumes on east–west state highways between State Route 99 and Interstate 5 are very high. Figure 2-28 illustrates the magnitude of five-axle or greater truck volumes on state routes in Kern County. The 2009 Caltrans truck count report shows that every day there are 6,700 five-axle trucks on State Route 58 east of the interchange with State Route 99 (9.9 percent of the AADT) and 8,000 five-axle trucks at the interchange at Cottonwood Road (12.2 percent of the AADT.)

### ***Heavy Truck Traffic through Bakersfield***

Planning for the accommodation of heavy truck traffic traveling through Bakersfield needs to consider four types of movements.

1. Internal to internal trips
2. External to external trips
3. Internal to external trips
4. External to internal trips

Internal to internal trips have both origin and destination within the metropolitan Bakersfield area. External to external (through-trips) have both trip ends outside of the study area. Internal–external and external–internal trips have one trip end outside of Kern County.

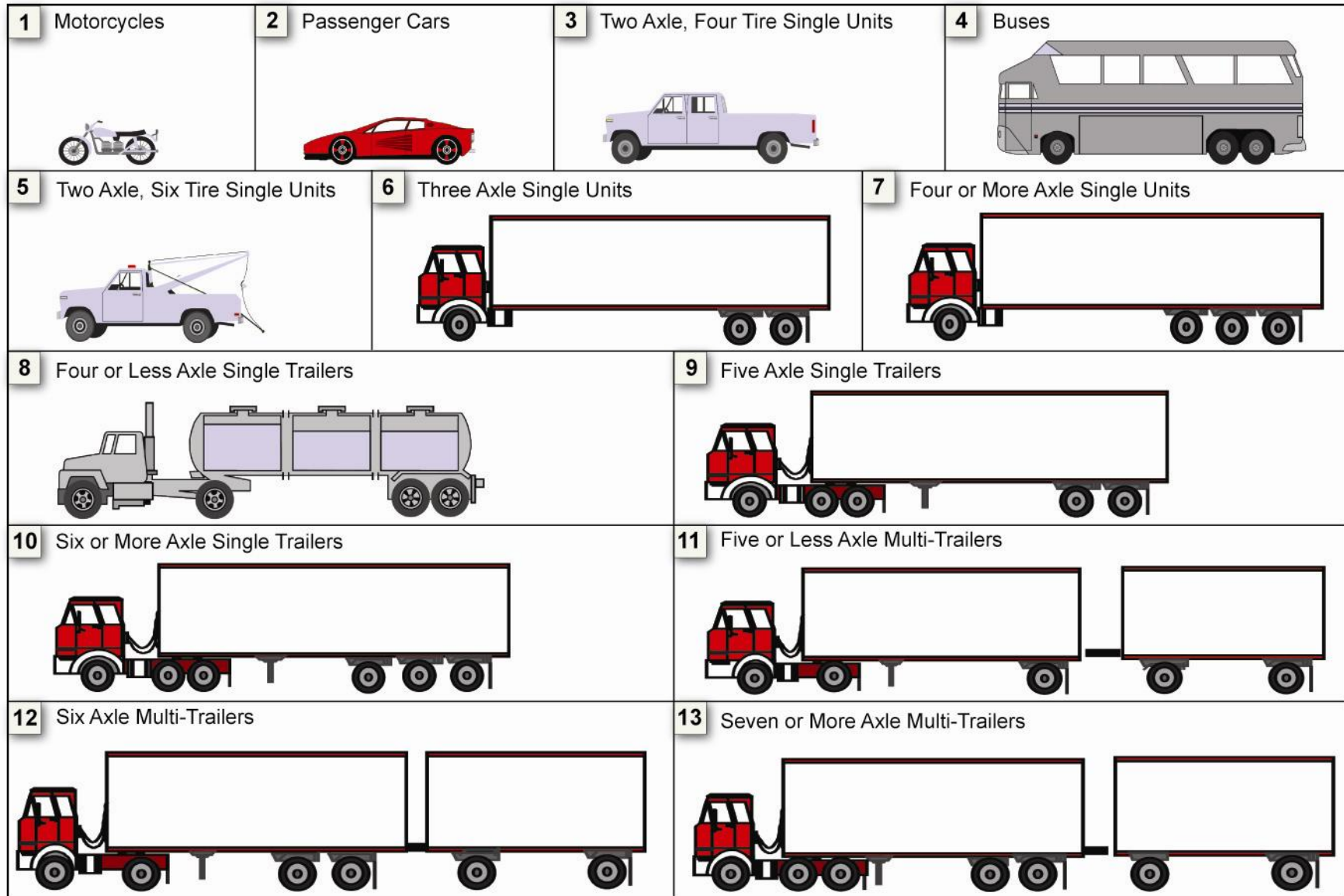
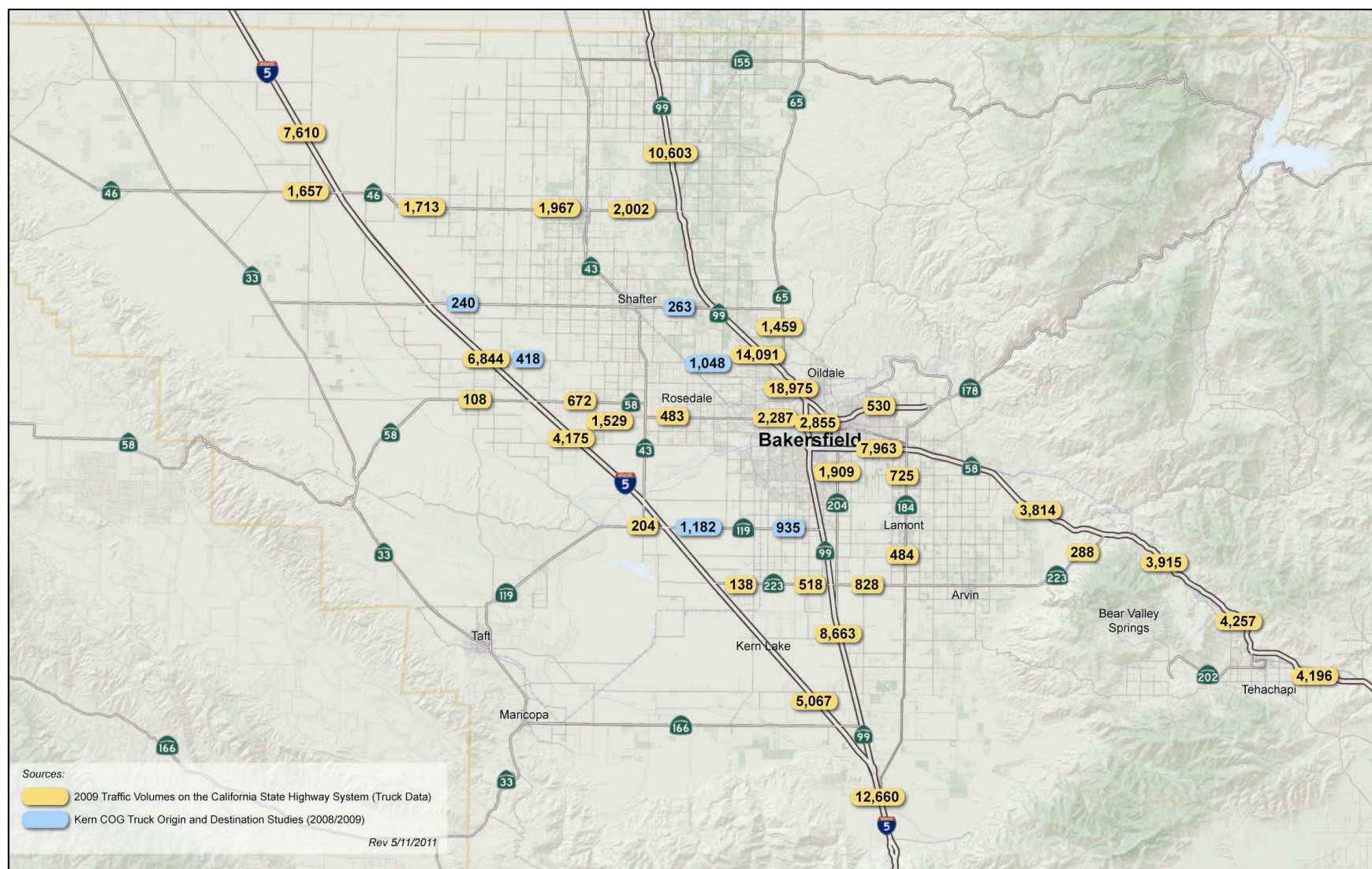


Figure 2-27: Federal Highway Administration Vehicle Classifications



**Figure 2-28: Five-Axle Truck Volumes in Metropolitan Bakersfield**

Because there is no clear, unimpeded roadway allowing travel in an east–west direction through Bakersfield, traffic tends to use multiple state highways and local arterials to accomplish this task. The major east–west routes that provide direct connectivity between the major north–south routes (State Route 99 and Interstate 5), which are most likely to have truck traffic attracted to the Centennial Corridor facility are as follows: State Route 46, Lerdo Highway, 7th Standard Road, State Route 58, Stockdale Highway and State Route 119. State Route 223 is located south of the proposed Centennial project, and is not likely to contribute a significant volume of trucks to the Centennial project. By looking at the precise counts developed in the Kern Council of Governments truck origin and destination studies, one can observe a picture of the truck traffic as it passes through Bakersfield.

Table 2-13 reports traffic volumes east of Interstate 5 and west of State Route 99, divided into categories by total AADT, heavy truck traffic, and percentage of heavy trucks. By showing the existing traffic counts at these two screenlines, one notes that there are 4,690 heavy trucks east of Interstate 5 and 6,710 heavy trucks west of State Route 99. Ultimately, it is the traffic volume that is counted east of Interstate 5 that provides the most accurate estimate of the through-trip trucks traversing Bakersfield. The truck traffic counts west of State Route 99 will also include a number of heavy trucks with local destinations, usually serving large retailers or accessing distribution hubs.

**Table 2-13. Vehicle and Truck Traffic East of Interstate 5 and West of State Route 99**

EAST OF INTERSTATE 5			WEST OF STATE ROUTE 99		
AHEAD TOTAL AADT	HEAVY TRUCK VOLUME*	PERCENT HEAVY TRUCKS	BACK TOTAL AADT	HEAVY TRUCK VOLUME*	PERCENT HEAVY TRUCK
<b>State Route 46</b>					
5,830	1,820	31.2%	6,710	1,976	29.4%
<b>Lerdo Highway</b>					
2,103	240	11.4%	11,455	263	2.3%
<b>7th Standard Road</b>					
2,597	418	16.1%	10,667	1,048	9.8%
<b>State Route 58</b>					
7,043	851	12.1%	49,500	2,287	4.6%
<b>Stockdale Highway</b>					
3,649	179	4.9%	7,754	201	2.6%
<b>State Route 119</b>					
10,000	1,182	11.8%	10,572	935	8.8%
<b>Total Volumes</b>					
<b>31,222</b>	<b>4,690</b>	<b>15.0%</b>	<b>96,658</b>	<b>6,710</b>	<b>6.9%</b>

\*5+ axle volume

### **Truck Traffic along Rosedale Highway (State Route 58 West)**

Vehicle classification counts were conducted along Rosedale Highway in February 2008 to supplement the truck volume data compiled by Caltrans. Table 2-14 summarizes the two-way traffic count data, following the Caltrans method of vehicle classification. Weekday (Monday through Friday) daily average count data is presented.

**Table 2-14. Supplemental Truck Counts on State Route 58 West (Rosedale Highway)**

LOCATION TIME	ADT TOTAL	TOTAL TRUCKS	TOTAL TRUCK %	2-AXLE VOLUME	3-AXLE VOLUME	4-AXLE VOLUME	TOTAL 2-3-4-AXLE VOLUME	5+ -AXLE VOLUME	5-AXLE PERCENT OF ADT
<b>West of Mohawk Street</b>									
Weekday average	42,511	5,327	12.5	1,407	1,147	697	3,251	2,076	4.9
<b>West of Calloway Drive</b>									
Weekday average	30,708	3,263	10.6	484	680	381	1,545	1,718	5.6
<b>West of Allen Road</b>									
Weekday average	16,435	1,803	11.0	403	362	224	989	814	5.0
<b>East of Enos Lane (State Route 43)</b>									
Weekday average	7,105	1,118	15.7	287	194	133	614	504	7.1

Note: Weekday average of Monday, February 11, 2008 through Friday, February 15, 2010

## 2.7 Public Transit Service

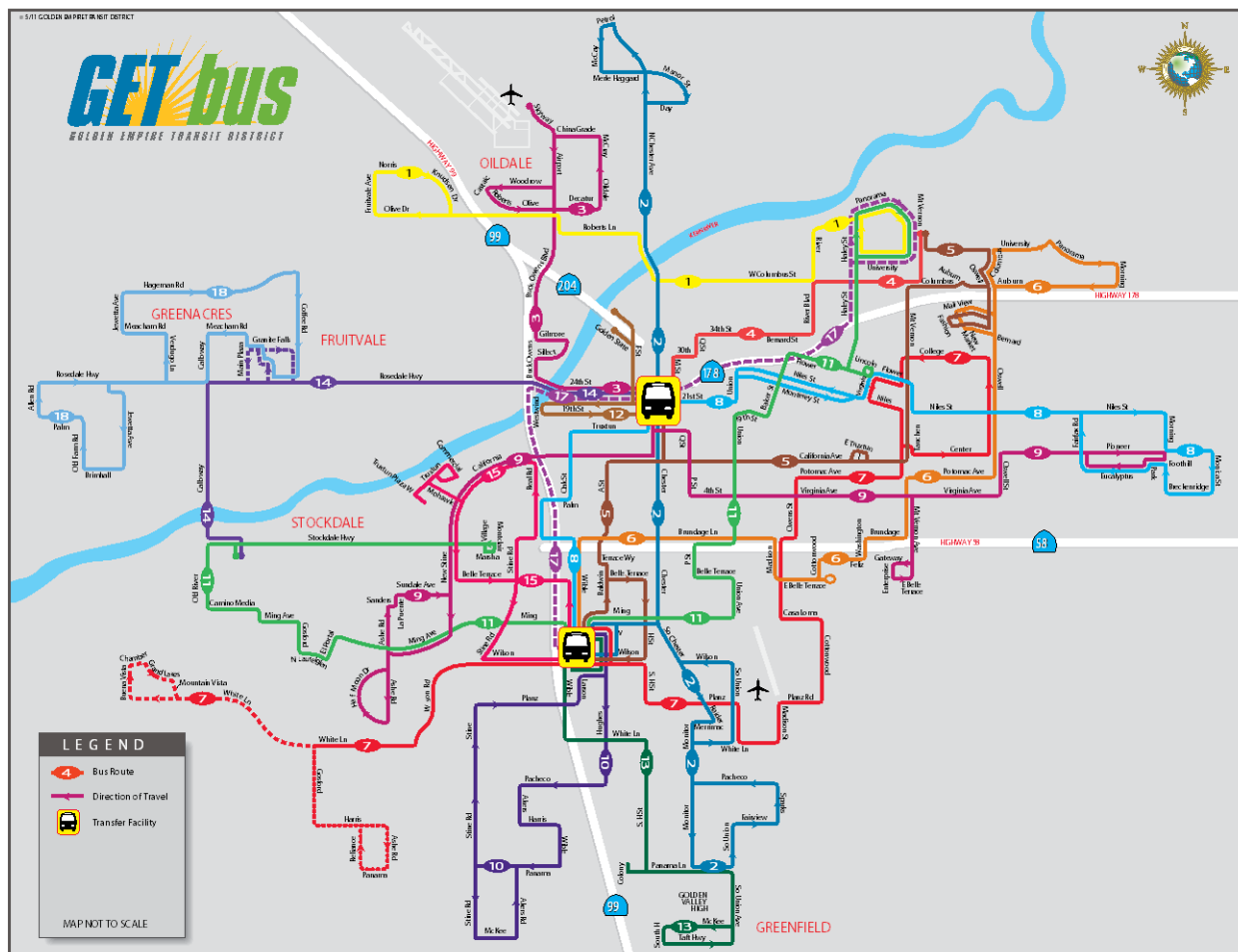
Public transit service in the Bakersfield metropolitan area is provided by the Golden Empire Transit District (GET), Kern Regional Transit Division, Amtrak and Greyhound. Four transit centers are located within the study area: the Downtown Transit Center, the Southwest Transit Center, the Bakersfield Greyhound Station and the Bakersfield Amtrak Station.

The Golden Empire Transit District provides bus service to approximately 24,000 citizens in Bakersfield each week. A recent survey conducted by GET revealed that 56 percent of their passengers have no other mode of transportation, relying almost entirely on the bus service. The bus service has more than 7 million annual boardings and travels more than 3.6 million miles per year. GET serves an area of 60 square miles with a fleet of 81 buses and 19 GET-A-Lift buses, which are fueled with clean burning, compressed natural gas. All buses are equipped with bike racks and wheelchair lifts. Figure 2-29 illustrates the GET route locations.

In addition, the Kern Regional Transit Division provides transit services to the unincorporated cities within Kern County. Some of the routes offer service between Bakersfield and the surrounding rural communities, examples of which are the intercity Buttonwillow Route between Buttonwillow and Bakersfield, and the Westside Express route between Taft and Bakersfield.

Amtrak, a nationwide rail service provider, has one route serving the study area. The Bakersfield Amtrak Station is the terminus for the San Joaquin route. AmtrakThruway is Amtrak's system of intercity coaches, locally contracted transit buses, through-ticketed local bus routes and taxi services to connect Amtrak train stations to areas not served by its railroads. In addition to providing connecting service to unserved areas, some Thruway motorcoaches operate as redundant service along well-established passenger rail corridors to add additional capacity. When normal Amtrak rail service encounters disruptions, temporary Thruway motorcoach service is established. There are seven Thruway routes that serve the study area in Bakersfield.

Greyhound is the largest provider of intercity bus transportation nationwide. It serves more than 2,300 destinations with 13,000 daily departures across North America. The Bakersfield Greyhound Station is located at 1820 18th Street.



Source: Golden Empire Transit District

**Figure 2-29: Golden Empire Transit Bus Route Map**

The existing transit services in the study area are:

- GET 1, 2, 3, 5, 6, 7, 8, 9, 11, 12, 14, 15, 17, 18
- Regional Transit District 8 Routes
- Amtrak Thruway 1a, 1b, 9, 10, 12, 19a, 19b
- Amtrak San Joaquin

The GET bus service provides the following route network:

- Route 1—Olive Drive/Bakersfield College
- Route 2—Chester Avenue/Oildale
- Route 3—Downtown
- Route 4—Bakersfield College/Downtown
- Route 5—Bakersfield College/Valley Plaza
- Route 6—Valley Plaza/East Hills
- Route 7—Stockdale High/Kern Medical Center
- Route 8—Foothill High/Valley Plaza
- Route 9—Foothill/Half Moon

- Route 10—Panama/Akers
- Route 11—Cal State/Bakersfield College
- Route 12—Westchester
- Route 13—Greenfield/Valley Plaza
- Route 14—Rosedale/Cal State
- Route 15—Mervyn's/Valley Plaza
- Route 17—Crosstown Express
- Route 18—Rosedale Connector
- Route 25—Replaces Routes 12 and 15 on Weekends
- Route 26—Replaces Routes 14 and 18 on Weekends

Regular fare for a single ride on GET a standard bus is \$1.25; \$1.50 for an express bus. Children 5 years old and under ride free when accompanied by a fare paying adult. GET-A-Lift fares are \$2.50 for a single ride. Day passes are \$3.00 standard; \$5.00 express. Standard monthly bus passes are \$36.00, or \$18.00 for those qualifying for reduced rates, while Express monthly bus passes are \$50.00, or \$25.00 for those qualifying for reduced rates. Table 2-15 presents the bus routes and the service frequency in the study area.

**Table 2-15. Golden Empire Transit Bus Service Frequency**

ROUTE	WEEKDAY SERVICE FREQUENCY	WEEKEND SERVICE FREQUENCY
Route 1 Olive/Bakersfield College	40 minutes	30 minutes
Route 2 Chester Avenue/Oildale	20 minutes	30 minutes
Route 3 Downtown	30/60 minutes	60 minutes
Route 4 Bakersfield College/Downtown	20 minutes	30 minutes
Route 5 Bakersfield College/Valley Plaza	20 minutes	20 minutes
Route 6 Valley Plaza/ East Hills	60 minutes	60 minutes
Route 7 Stockdale Highway/Kern Medical Center	30/60 minutes	30 minutes
Route 8 Foothill High/Valley Plaza	30/60 minutes	30 minutes
Route 9 Foothill/Half Moon	30 minutes	30/60 minutes
Route 10 Panama/Akers	30/60 minutes	18/40 minutes
Route 11 Cal State/Bakersfield College	30/60 minutes	30 minutes
Route 12 Westchester	45 minutes	—
Route 13 Greenfield/Valley Plaza	30 minutes	30 minutes
Route 14 Rosedale/Cal State	45 minutes	—
Route 15 Mervyn's/Valley Plaza	60 minutes	—
Route 17 Crosstown Express	30 minutes	—
Route 18 Rosedale Connector	45 minutes	—
Route 25 Replaces Routes 12 and 15 on weekends	—	90 minutes
Route 26 Replaces Routes 14 and 18 on weekends		45–75 minutes

Source: Golden Empire Transit District (2011)

The Kern Regional Transit Division serves the study area with the following routes:

- Buttonwillow
- East Kern Express
- Frazier Park Express
- Lake Isabella
- Lamont-Bakersfield
- Lost Hills
- North Kern Express
- Westside Express

General public fares for the Kern Regional Transit Division buses are \$1.75 per one-way ride. One child under the age of five may travel for free when accompanied by a paying adult. A one-way fare for seniors, disabled and youth (5–15) is \$1.25. Table 2-16 presents the bus routes and the service frequency in the study area.

**Table 2-16. Kern Regional Transit Bus Service Frequency**

ROUTE	DAYS OF OPERATION	TRIPS PER DAY
Buttonwillow	Tuesday/Thursday	2
East Kern Express	Monday–Saturday	8
Frazier Park Express	Monday–Saturday	4
Lake Isabella	Monday–Saturday	4
Lamont - Bakersfield	Monday–Sunday	14
Lost Hills	Thursday/Saturday	5/3
North Kern Express	Weekdays/weekends	7/3
Westside Express	Weekdays/Saturday	5/3

Source: Kern County Roads Department (2011)

Existing intercity passenger rail service in California is provided by Amtrak on four principal corridors covering more than 1,300 linear miles and spanning almost the entire state. The existing passenger rail network in the study area includes one of these corridors, the San Joaquin Route.

The San Joaquin Amtrak Route includes two trips daily in each direction from Bakersfield to Sacramento, for a total of six daily roundtrips. The intercity route carried more than 819,000 riders in 2007 with an on-time performance of 67.9 percent. The scheduled running time between Bakersfield and Oakland averages 6 hours 9 minutes, at an average speed of 51.3 miles per hour. The maximum speed on the route is 79 mph (Caltrans, 2008).

The California State Rail Plan 2007/8–2017/18 (Caltrans, 2008) envisions an increase in service to eight daily roundtrips by 2018, carrying 1,430,000 annual riders, with 90 percent on-time performance and seeks to reduce the travel time from Bakersfield to Oakland to less than six (6) hours.

## 2.8 Traffic Accident Data

Tables 2-17 and 2-18 summarize the traffic accident data (from August 2007 to March 2010) compiled by the California Department of Transportation Traffic Accident Surveillance and Analysis System (TASAS) for State Route 58 and State Route 99, respectively.

**Table 2-17. Accident History for State Route 58**

LOCATION (STUDY AREA)	TOTAL ACCIDENTS	TOTAL FATALITIES	ACTUAL ACCIDENT RATE*			AVERAGE ACCIDENT RATE*		
			FATAL	FATAL + INJURY	TOTAL	FATAL	FATAL + INJURY	TOTAL
SR 58 (PM T52.13 to PM R55.40)	373	2	0.008	<b><u>0.41</u></b>	<b><u>1.46</u></b>	0.010	0.28	0.86

**Bold and underline** font indicates actual accident rates that are greater than the statewide average for similar facilities.

\*The accident rate is accidents per million vehicle-miles. The fatal, fatal plus injury, and total accident rates are listed.

Source: The California Department of Transportation District 6, 2011

**Table 2-18. Accident History for State Route 99**

LOCATION (STUDY AREA)	TOTAL ACCIDENTS	TOTAL FATALITIES	ACTUAL ACCIDENT RATE*			AVERAGE ACCIDENT RATE*		
			FATAL	FATAL + INJURY	TOTAL	FATAL	FATAL + INJURY	TOTAL
SR 99 (PM 22.10 to PM 24.60)	533	3	0.008	<b><u>0.41</u></b>	<b><u>1.50</u></b>	0.011	0.33	1.07

**Bold and underline** font indicates actual accident rates that are greater than the statewide average for similar facilities.

\*The accident rate is accidents per million vehicle-miles. The fatal, fatal plus injury, and total accident rates are listed.

Source: The California Department of Transportation District 6, 2011

On State Route 58, between Real Road and Cottonwood Road, there were 373 accidents (two involving fatalities). This segment of the freeway has a higher than average total accident rates when compared to similar California freeways. Approximately 64 percent of the accidents were in the westbound direction with a higher percentage of the accidents between 3:00 and 5:00 p.m. The peak accident day of the week was Thursday with 18 percent. The three highest collision types were rear end (57 percent), hit object (20 percent), and sideswipe (13 percent). Speeding (60 percent) was the highest primary collision factor, followed by improper turn (15 percent) and other violations (14 percent).

On State Route 99, between Wilson Road and California Avenue, there were 533 accidents (three involving fatalities). This segment of State Route 99 has a higher than average total accident rates when compared to similar California freeways. There were more southbound collisions (53 percent), than northbound (47 percent) on State Route 99. Approximately 43 percent of all the accidents occurred between 3:00 and 5:00 p.m. The day of the week that had the most accidents was Friday with 22 percent. The three highest collision types were rear end (60 percent), sideswipe (19 percent), and hit object (15 percent). Speeding (57 percent) was the highest primary collision factor, followed by other violations (25 percent) and improper turn (10 percent).

## **2.9 Bicycle Routes and Trails**

Bicycle facilities are located throughout Bakersfield. The city has approximately 24 miles of bicycle paths and 79 miles of bicycle lanes. Figure 2-30 presents the bike lanes located in Bakersfield. An additional 90 miles of bicycle lanes and 43 miles of bicycle routes have been planned throughout the city. Most of the bicycle lanes are located on the south side of the Kern River along major arterials such as Stockdale Highway, Oak Street, Chester Avenue, and White Lane. Similarly, bicycle lanes on the north side of the river are located on major roadways such as Calloway Drive, Hageman Road, and Coffee Road.

The Kern River Parkway Bicycle Trail, situated along the perimeter of the Kern River on the south side, begins at the mouth of Kern Canyon near Alfred Harrell Highway in the east and extends westward more than 30 miles to Enos Lane near Interstate 5. The bicycle trail traverses a number of parks within the city such as the River Oaks Park, Yokuts Park, and Beach Park.

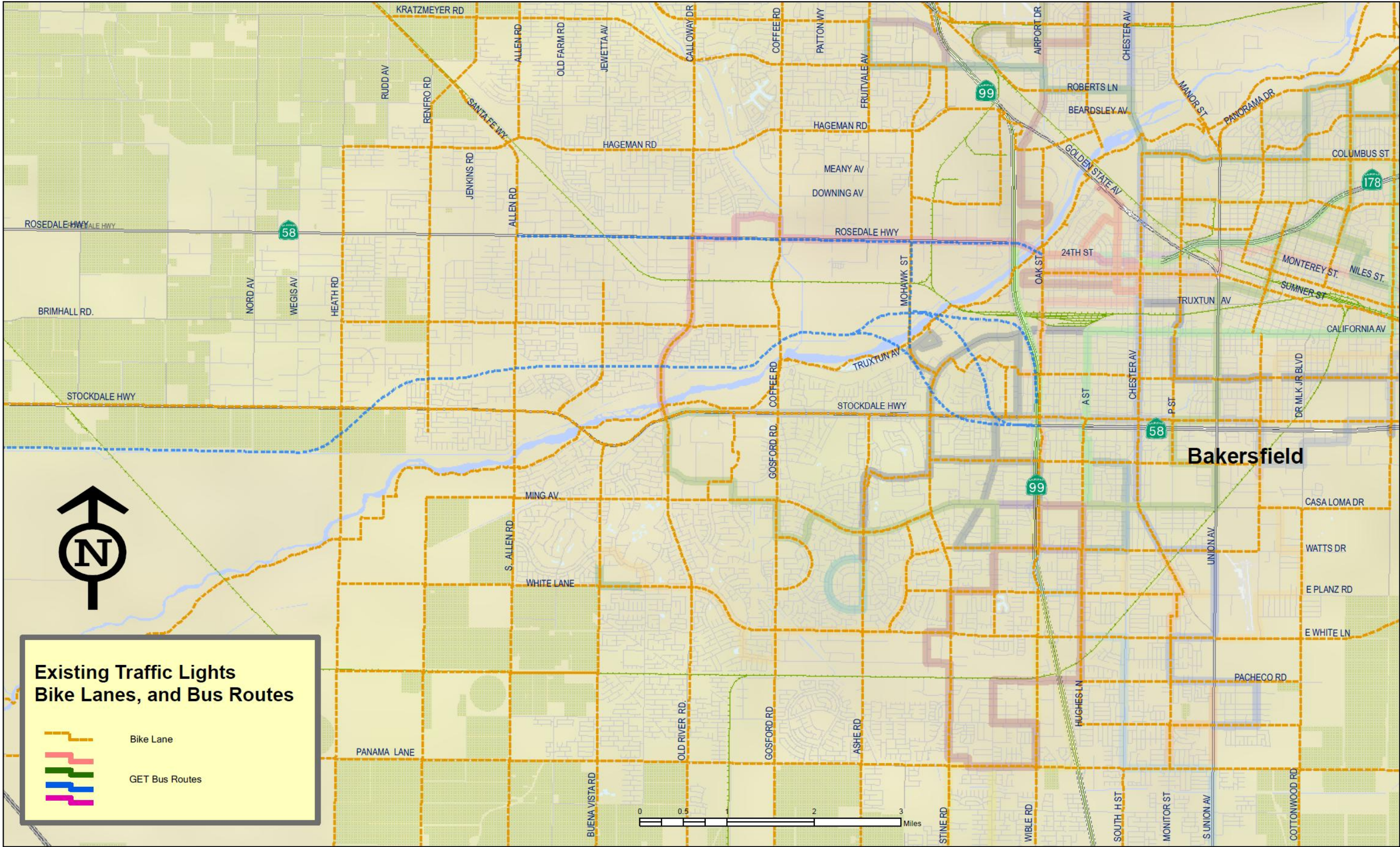


Figure 2-30: Golden Empire Transit Routes and Bicycle Lanes



## **CHAPTER 3. TRAFFIC VOLUME FORECAST**

### **3.1 Travel Forecast Model**

The Kern Council of Governments (Kern COG) maintains and runs a travel demand forecast model for the Kern County region. The model is used to forecast the demand for future transportation infrastructure by predicting future travel patterns based on a variety of factors including locally approved general plan land use entitlements, input from local planning departments on socio-economic growth areas, and state and federal data sources. Some of the forecast input variables include population, households, employment, school enrollment, income, traffic counts, speeds, intersection configuration, and existing or planned transportation networks.

The current Kern COG model was developed in 1998 and updated in 2007. The updated model was approved by the Kern Regional Transportation Modeling Committee in February 2008. The modeling committee provides oversight for the Kern Regional Transportation Model and consists of staff representatives from Kern COG, local entities, and California Department of Transportation (Caltrans) District 6.

The model update was a cooperative effort between Kern COG, Dowling Associates, Inc. and Parsons Transportation Group. The update to the model for Kern County uses the standard “four-step” travel modeling process. In addition to network and socio-economic demographic updates, this process consists of trip generation, trip distribution, mode choice and trip assignment. External trips have been updated using the latest 2001 Caltrans Statewide Model, and time-of-day factors have been calibrated based on new survey information. The model update was calibrated to 2006 population, employment and traffic count data, and back-checked or validated against 2003 socio-demographic data.

In late 2008/early 2009, the model was updated to reflect relatively minor refinements requested by Kern Regional Transportation Modeling Committee members. These refinements included:

- Subdivision of trip attraction rates for high, medium, and low intensity retail land use travel generators;
- Subdivision of trip attraction rates for service-office and service-warehousing land use travel generators;
- Increasing freeway ramp capacities for diamond on-ramps, from 800 vehicles per hour to 1,000 vehicles per hour, per lane;
- Increasing urban freeway free flow speeds from 55 mph to 65 mph; and
- Minor land use shifts between adjacent traffic analysis zones for future growth conditions.

These refinements, collectively known as the Kern COG 2006 Regional Travel Model (Update 1), were validated to 2006 demographic and traffic count data as discussed above. Model Update 1 was approved by the Kern Regional Transportation Modeling Committee in February 2009.

## 3.2 Land Use Assumptions

Population and employment projections are essential for the travel demand model to evaluate the appropriate size and location of transportation projects. The increasing population in Kern County is the most significant factor in the need to develop new transportation facilities. The demographic projections used in the model are also tied to the air quality conformity process, which must be completed before Caltrans releases state and federal highway funds for project design and construction.

It is the policy of Kern COG to revise the county growth forecast every three to five years to adjust for major changes in regional growth trends. In July 2005, the Kern COG Board considered the 2004 California Department of Finance growth forecast before adopting the Kern COG population projections. The California Department of Finance's most recent 2007 forecast indicates that the Kern County regional population would reach 1.35 million in 2030; increasing to 2.1 million by 2050. The Kern Council of Governments considered adopting new population and employment projections in 2009; however, they decided to maintain the historical trend line as reflected in the currently adopted population projections.<sup>1</sup>

The California Department of Finance has issued population projections for more than 40 years. Many local jurisdictions have used these estimates for planning future infrastructure needs. The California Department of Finance estimate is considered the most acceptable source for future population numbers, even though many larger jurisdictions, such as Kern COG, will use these figures only as a guideline for making their own projections.

In the late 1990's, the Caltrans, Office of Transportation Economics, sought to provide additional information with which local jurisdictions could improve the transportation planning process. In 2000, Caltrans contracted with the California Economic Forecast, Inc. to provide complete economic and population forecasts for all 58 counties up to the terminal year 2020.

In 2006, California Economic Forecast began providing projections through the terminal year 2030. As of the current March 2010 edition, the forecast horizon has been extended to 2035. As the California Economic Forecast report becomes widely known and recognized, more local jurisdictions are using these projections as an additional resource to plan for future development.

Table 3-1 presents a comparison of population projections prepared by the California Department of Finance, the California Economic Forecast report and the projections adopted by Kern COG. Figure 3-1 illustrates the California Department of Finance and Kern COG population projections in a graphic format. All of these sources point to a regular and gradual population increase, resulting in significant regional increases over the next 40 years.

Kern COG has recently completed the planning process for transportation projects included in the regional transportation plan<sup>2</sup>. This process uses the population projections that the Board approved in July 2005 for determining compliance with the current San Joaquin Valley Air Quality Conformity Plan.

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<sup>1</sup> Kern COG, *Final Regional Growth Forecast Report*, October 2009.

<sup>2</sup> Kern COG, *2011 Final Regional Transportation Plan*, July 15, 2010; Amendment #1, May 19, 2011.

Table 3-1. Comparison of Kern County Population Forecasts

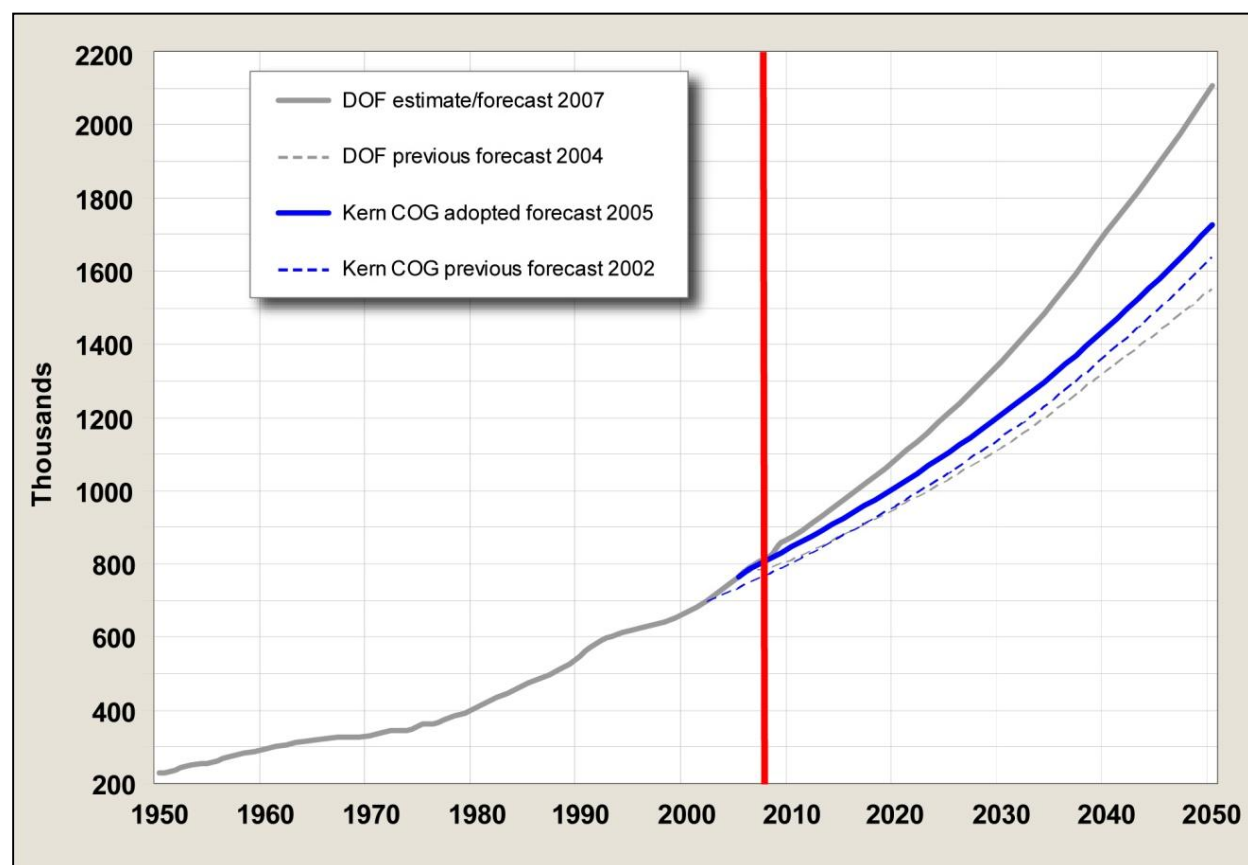
YEAR	CA DEPARTMENT OF FINANCE <sup>1</sup>		CALIFORNIA ECONOMIC FORECASTS REPORT <sup>2</sup>					KERN COG <sup>3</sup>
	2004	2007	2005	2005	2007	2008	2010	2005
1995			630,300					
2000	664,694	665,519	665,367	665,373				
2005	732,800		767,764	770,424	768,928			765,600
2010	808,808	871,728	886,417	895,263	885,176	853,486	848,730	845,600
2015			1,009,368	1,036,709	1,005,806	950,991	938,042	924,533
2020	950,112	1,086,113	1,132,743	1,185,769	1,128,324	1,057,804	1,040,449	1,010,800
2025			1,255,384	1,331,953	1,241,859	1,165,153	1,148,731	1,105,094
2030	1,114,878	1,352,627		1,474,471	1,347,635	1,272,081	1,256,152	1,208,200
2035							1,367,600	1,321,000
2040	1,325,648	1,707,239						1,444,100
2050	1,549,594	2,106,024						1,726,200

Sources:

<sup>1</sup>California Department of Finance, Demographic Research Unit, May 2004 and July 2007

<sup>2</sup>California Department of Transportation, county-level economic forecast reports from 2005, 2006, 2007, 2008 and 2010 prepared by Dr. Mark Schniepp, California Economic Forecasts, Inc.

<sup>3</sup>Kern Council of Governments, Kern County Travel Demand Model Population Forecast, updated 2005.



Source: Kern Council of Governments *Final Regional Growth Forecast Report*, October 2009

Figure 3-1: Comparison of Kern County Population Forecasts

The travel forecast model incorporates general plan growth reflecting the Kern COG adopted population levels, which includes land development proposals pending approval. This 2035 land use scenario equates to a population of 1,321,000. Although this population estimate is less than those provided by the California Department of Finance or the California Economic Forecast report, Kern COG continues to utilize its 2005 era population projection because it most accurately reflects local and regional economic conditions.

Table 3-2 lists the distribution of population and households within Kern County, whereas Figure 3-2 illustrates the distribution of household growth within metropolitan Bakersfield between 2006 and 2035, based on the currently adopted Metropolitan Bakersfield General Plan land use map. This distribution of household growth considers all approved and pending project entitlements as of December 14, 2007 and minor shifts in housing units between adjacent traffic analysis zones as requested by the City of Bakersfield and Kern County. In general, the distribution of growth on developable lands intensifies as the proximity to central Bakersfield increases. Thus, entitled and pending entitlements along the fringes of metropolitan Bakersfield may not be fully developed by the 2035 planning horizon.

Figure 3-3 provides a corresponding distribution of metropolitan Bakersfield employment growth between 2006 and 2035. These allocations of population and employment growth were prepared by Kern COG based on local entity input, and approved by the Kern Regional Transportation Modeling Committee in February 2008 and February 2009.

Figures 3-2 and 3-3 indicate that a low proportion of household growth and a high proportion of employment growth are forecast to occur in the corridor served by the proposed Centennial Corridor project. This localized imbalance of jobs versus housing will likely place additional pressure on transportation facilities serving the westerly portion of metropolitan Bakersfield.

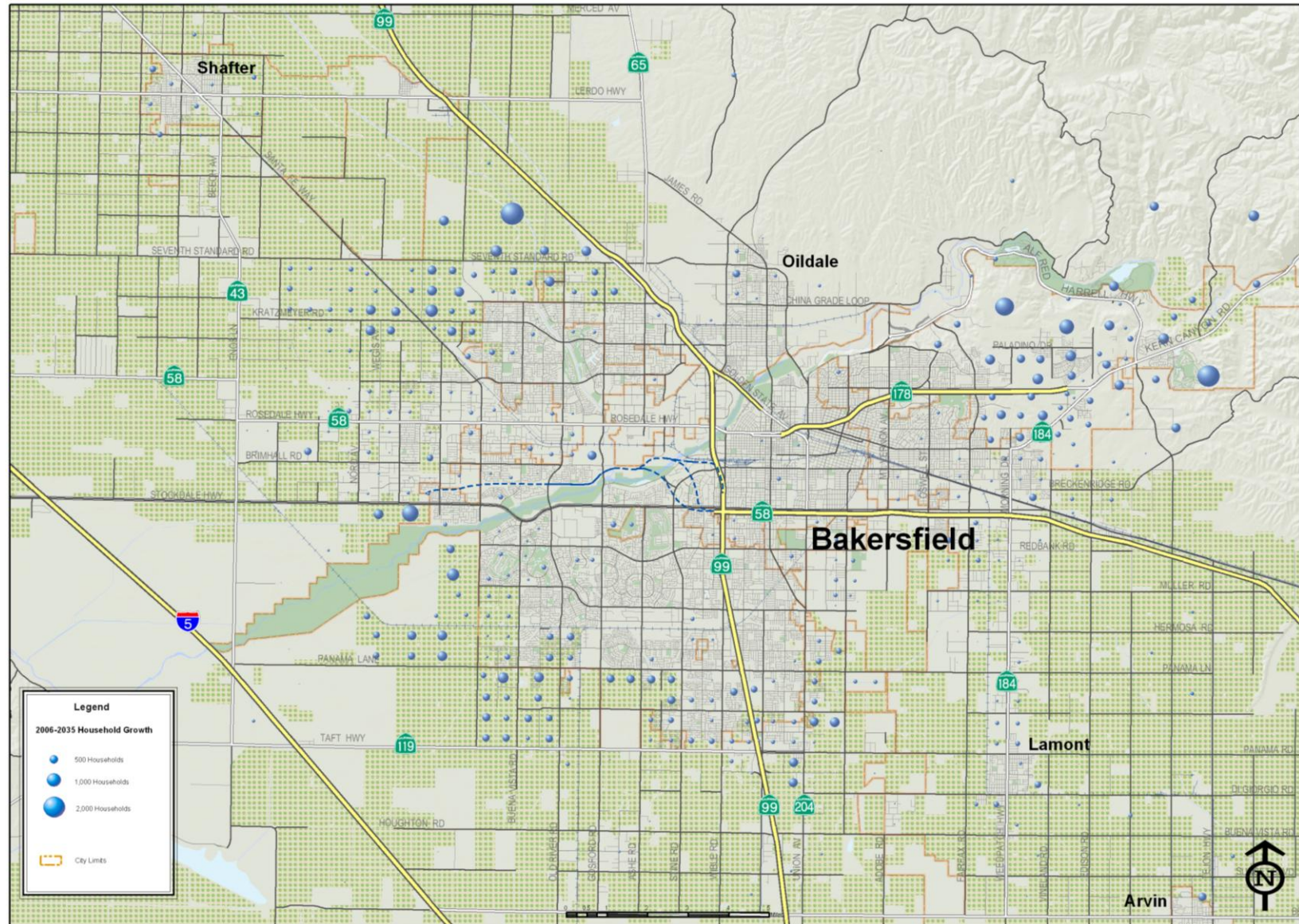
As required by Senate Bill 375, Kern COG has been working since 2009 with the Regional Modeling Committee to develop population and housing forecasts for the Sustainable Community Strategy and Regional Housing Needs Assessment. These population projections must be within 3 percent of the California Department of Finance population forecast for year 2020 and are included in the travel demand model for the *2014 Regional Transportation Plan*.

The California Department of Finance released a revised interim forecast in July 2011 that adjusts for the deviation of the previous population estimates by using the actual numbers from the United States 2010 census. California state officials have now determined that the Kern COG population projections are within the required 3 percent parameter, as the Kern COG projections are 2.97 percent below the California Department of Finance projections. Therefore, Kern COG will not be required to change its population forecast numbers for the *2014 Regional Transportation Plan*.

Table 3-2. Kern County and City Growth Trends

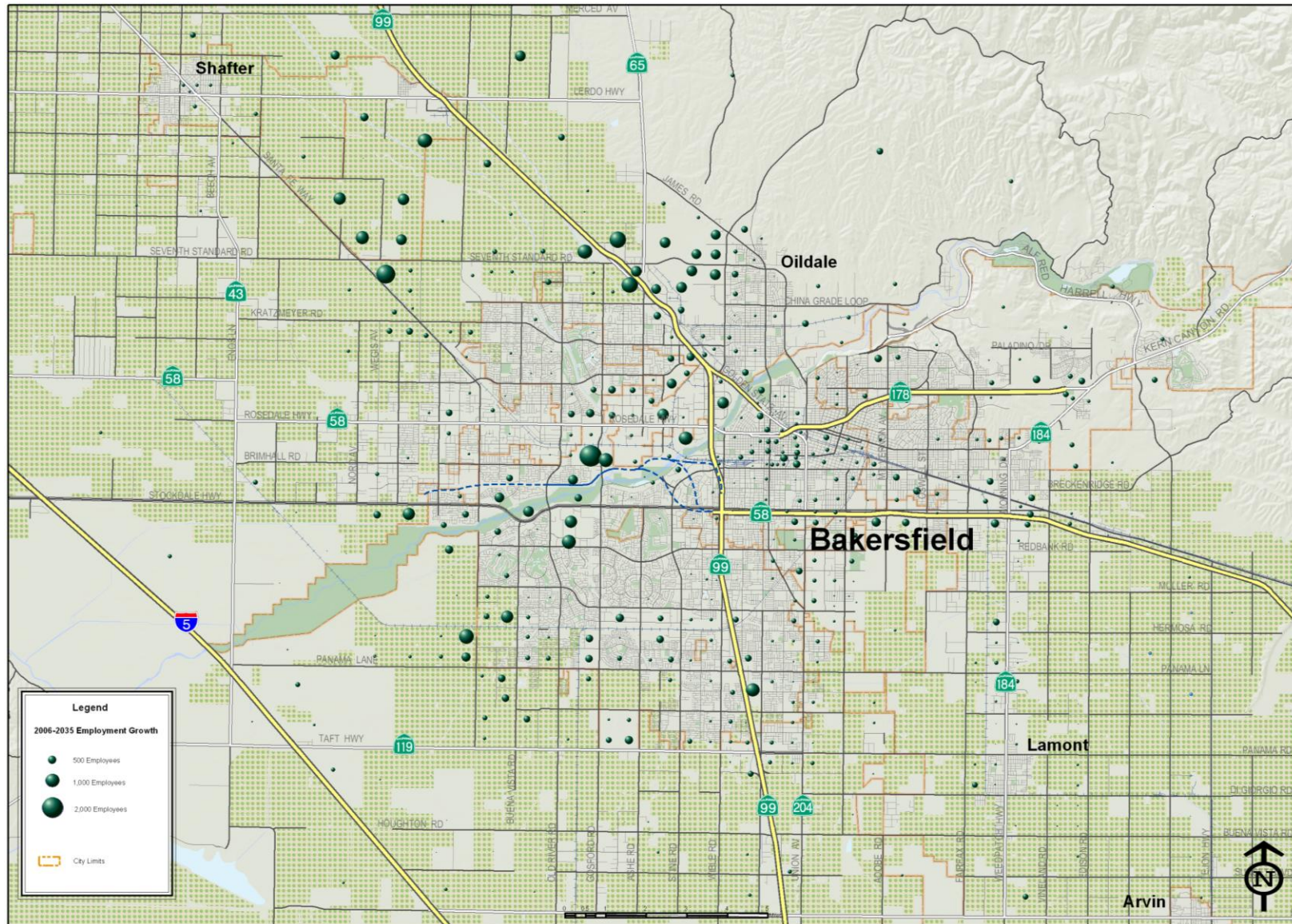
YEAR	CENSUS			FORECAST				AVERAGE ANNUAL GROWTH			
								1980–2010 HISTORIC		2010–2035 FORECAST	
	1980	1990	2000	2010	2020	2030	2035	RATE	INCREASE	RATE	INCREASE
<b>Kern County</b>											
Population	403,089	543,477	661,653	845,600	1,010,800	1,208,200	1,321,000	2.4%	14,750	1.8%	19,016
Households	139,881	181,480	208,655	271,327	319,200	381,600	417,200	2.2%	4,382	1.7%	5,835
<b>Metro Bakersfield</b>											
Population	228,000	329,100	409,800	533,461	640,536	764,941	848,487	2.8%	10,182	1.8%	12,601
Households	89,500	120,000	134,100	172,970	203,753	244,722	269,840	2.2%	2,782	1.8%	3,875
<b>Arvin</b>											
Population	6,863	9,286	12,956	17,100	22,800	29,100	33,400	3.0%	341	2.6%	652
Households	1,946	2,385	3,010	3,800	5,000	6,300	7,100	2.2%	62	2.5%	132
<b>Bakersfield</b>											
Population	105,611	174,820	246,899	341,700	437,800	541,600	609,600	3.8%	7,870	2.3%	10,716
Households	39,602	62,516	83,445	111,900	141,300	172,600	192,900	3.4%	2,410	2.2%	3,240
<b>California City</b>											
Population	2,743	5,955	8,385	15,300	20,600	26,700	30,700	5.6%	419	2.7%	616
Households	990	2,119	3,067	4,500	5,900	7,400	8,400	4.9%	117	2.5%	156
<b>Delano</b>											
Population	16,491	22,762	39,499	55,100	68,000	81,400	90,000	3.9%	1,287	1.9%	1,396
Households	4,912	6,236	8,411	10,600	12,900	15,200	16,700	2.5%	190	1.8%	244
<b>Maricopa</b>											
Population	946	1,193	1,111	1,150	1,250	1,340	1,400	0.6%	7	0.8%	10
Households	338	416	404	410	430	440	450	0.6%	2	0.4%	2
<b>McFarland</b>											
Population	5,151	7,005	9,835	13,800	17,000	20,400	22,500	3.2%	288	1.9%	348
Households	1,399	1,685	1,989	2,800	3,600	4,500	5,100	2.3%	47	2.4%	92
<b>Ridgecrest</b>											
Population	15,929	28,295	24,927	28,700	32,900	37,000	39,400	1.9%	426	1.3%	428
Households	5,762	10,349	9,826	11,100	12,600	14,000	14,900	2.2%	178	1.2%	152
<b>Shafter</b>											
Population	7,010	8,409	12,731	16,300	22,700	30,300	35,500	2.8%	310	3.1%	768
Households	2,284	2,558	3,292	4,200	6,300	8,900	10,800	2.0%	64	3.7%	264
<b>Taft</b>											
Population	5,316	5,902	8,811	9,300	11,600	14,000	15,500	1.8%	133	2.0%	248
Households	2,096	2,209	2,233	2,300	3,000	3,800	4,300	0.3%	7	2.5%	80
<b>Tehachapi</b>											
Population	4,126	5,791	11,125	14,000	18,200	22,800	25,800	4.0%	329	2.4%	472
Households	1,534	2,335	2,533	3,300	4,200	5,300	5,900	2.5%	59	2.3%	104
<b>Wasco</b>											
Population	9,613	12,412	21,263	26,000	33,100	40,700	45,700	3.3%	546	2.2%	788
Households	3,001	3,471	3,971	5,000	6,700	8,500	9,800	1.7%	67	2.7%	192
<b>Unincorporated</b>											
Population	223,290	261,647	264,111	307,150	324,850	362,860	371,500	1.1%	2,795	0.8%	2,574
Households	75,947	85,201	86,474	111,417	117,270	134,660	140,850	1.3%	1,182	0.9%	1,177

Source: Kern Council of Governments, 2011 Final Regional Transportation Plan, July 15, 2010.



Source: Metropolitan Bakersfield General Plan

Figure 3-2: Metropolitan Bakersfield Dwelling Unit Growth from 2006 to 2035



Source: Metropolitan Bakersfield General Plan

Figure 3-3: Metropolitan Bakersfield Employment Growth from 2006 to 2035

### 3.3 Roadway Network Assumptions

Highway network assumptions form a critical assumption insofar as the design year base network. The planned highway system is defined by the locally approved and adopted regional transportation plan. The regional transportation plan is a long-range transportation plan covering a 20+ year time span. The most recent complete document, the *2011 Regional Transportation Plan* (2011 RTP), was regionally adopted by the Kern COG Board on July 15, 2010 and federally approved on December 14, 2010. Amendment #1 to the 2011 RTP, which revised the implementation dates of several projects, was regionally approved on May 19, 2011 and federally approved on June 2, 2011. The 2011 RTP covers the 2011 to 2035 planning horizon and accomplishes the following objectives:

- Responds to projected population and employment growth,
- Is fiscally constrained by existing and projected revenue sources and amounts, and
- Ensures that project implementation of identified projects will reach air quality compliance.

Based on the 2011 RTP, multimodal facilities will be constructed, and transportation services implemented, on a level consistent with projected funding. Funding projections are based on the assumption that current levels and sources of funding will continue throughout the planning timeframe.

The Constrained Program of Projects, a complete list of planned improvements by mode, is provided in Table 4.1 of the 2011 RTP. The Constrained Program of Projects is consistent with those projects that have been evaluated according to air quality conformity guidelines and have been found to conform to state, regional, and federal air quality requirements. The 2011 RTP also identifies an Unconstrained Program of Projects. These projects are important to the development of Kern County's transportation system, but funding has not been identified or is not available at this time. The projects listed in the Unconstrained Program of Projects are not included in the air quality conformity model.

Figure 3-4 and Table 3-3 identify the projects that are included in Amendment #1 of the 2011 RTP. Projects involving improvements to the regional network which significantly impact or complement the Centennial Corridor project are highlighted in Table 3-3. Both the Kern COG travel demand forecast model and the air quality conformity model use this regional roadway network to anticipate traffic volumes, levels of service and vehicle emission data.

Kern COG regularly updates the transportation demand model used in conjunction with the regional transportation plan by conducting the Regionally Significant Roadway Survey. Local jurisdictions respond to this survey with information about roadway capacity increasing projects planned for construction between the current time and the year 2035. These projects are incorporated into proposed updates for the regional transportation plan and other documents. This process assures that the regional transportation plan reflects local intentions and is consistent with state and federal environmental requirements.

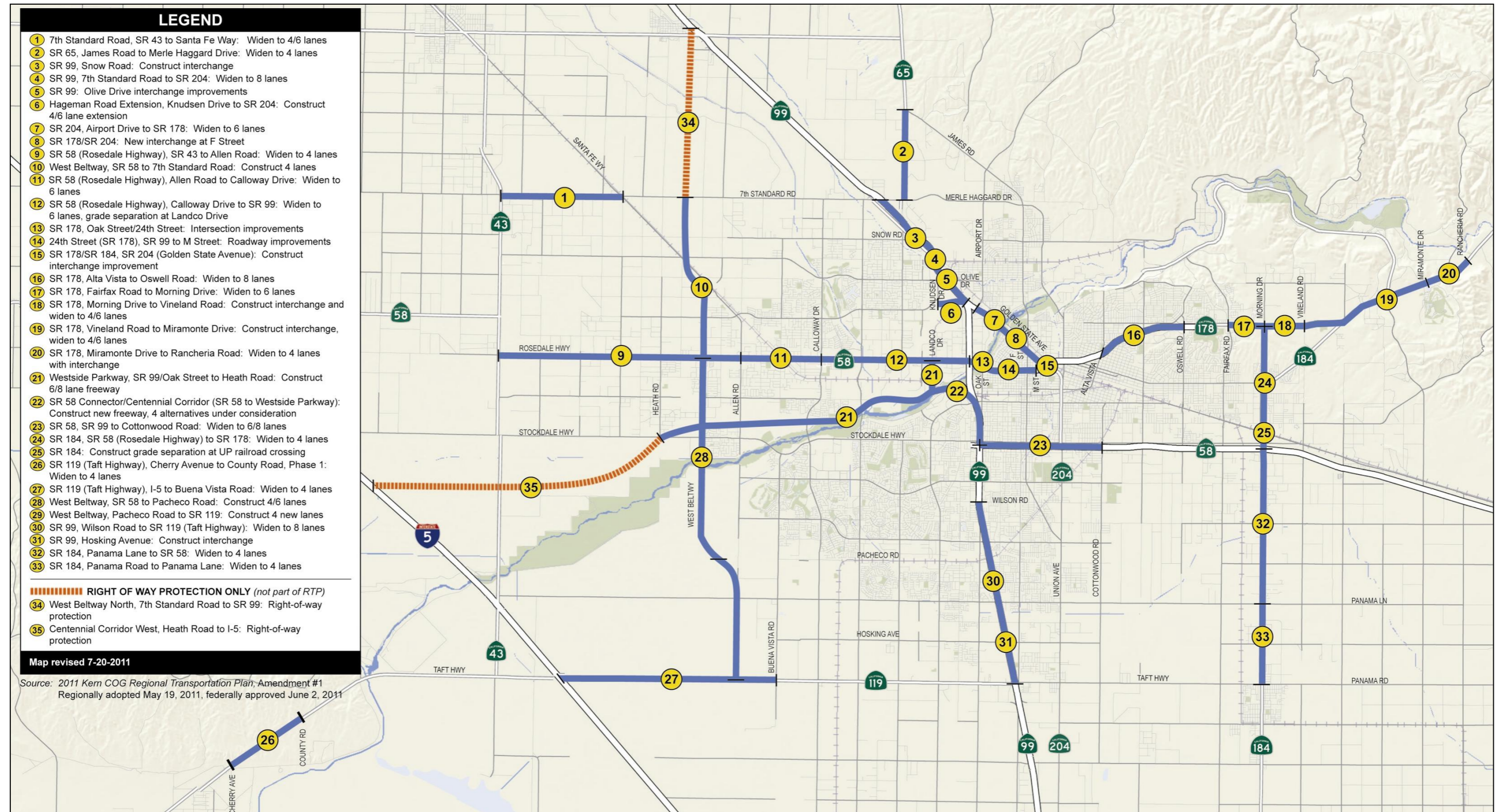
In addition to regional roadways identified in the 2011 RTP, the location and function of local arterial and major collector streets are identified in the circulation element of the Metropolitan Bakersfield General Plan.

These local roadways are constructed as land development warrants, using funds collected by the Metropolitan Bakersfield Transportation Impact Fee Program.

The Metropolitan Bakersfield Transportation Impact Fee was originally adopted by both the City Council and the County Board of Supervisors in 1992. The impact fee is a development fee, as laid out by the State of California Government Code Section 66000 *et seq.* The fee program consists of an ordinance to implement the fee on new development, a resolution adopting the regional transportation facilities list, and a transportation impact fee schedule. When first adopted, the facilities list included only those projects which were considered too large for individual developers to fund and construct on their own. The fee program was updated in 1997 and the facilities list was expanded to include roadway segments and traffic signals.

The transportation impact fee pays for the construction of both regional and local facilities that are required to maintain a traffic level of service “C” for the metropolitan Bakersfield transportation system. Only those facilities required by new development as allowed by the Metropolitan Bakersfield General Plan are covered by this transportation impact fee program. The fee schedule and/or list of projects have since been updated in 2002, 2003 and 2009.

The Phase IV Transportation Impact Fee regional transportation facilities list and transportation impact fee schedule were adopted by the Kern County Board of Supervisors on May 19, 2009; and by the Bakersfield City Council on July 7, 2009. Elements of the transportation impact fee program are illustrated on Figure 3-5. Together, these two sets of improvements constitute the roadway network assumptions.



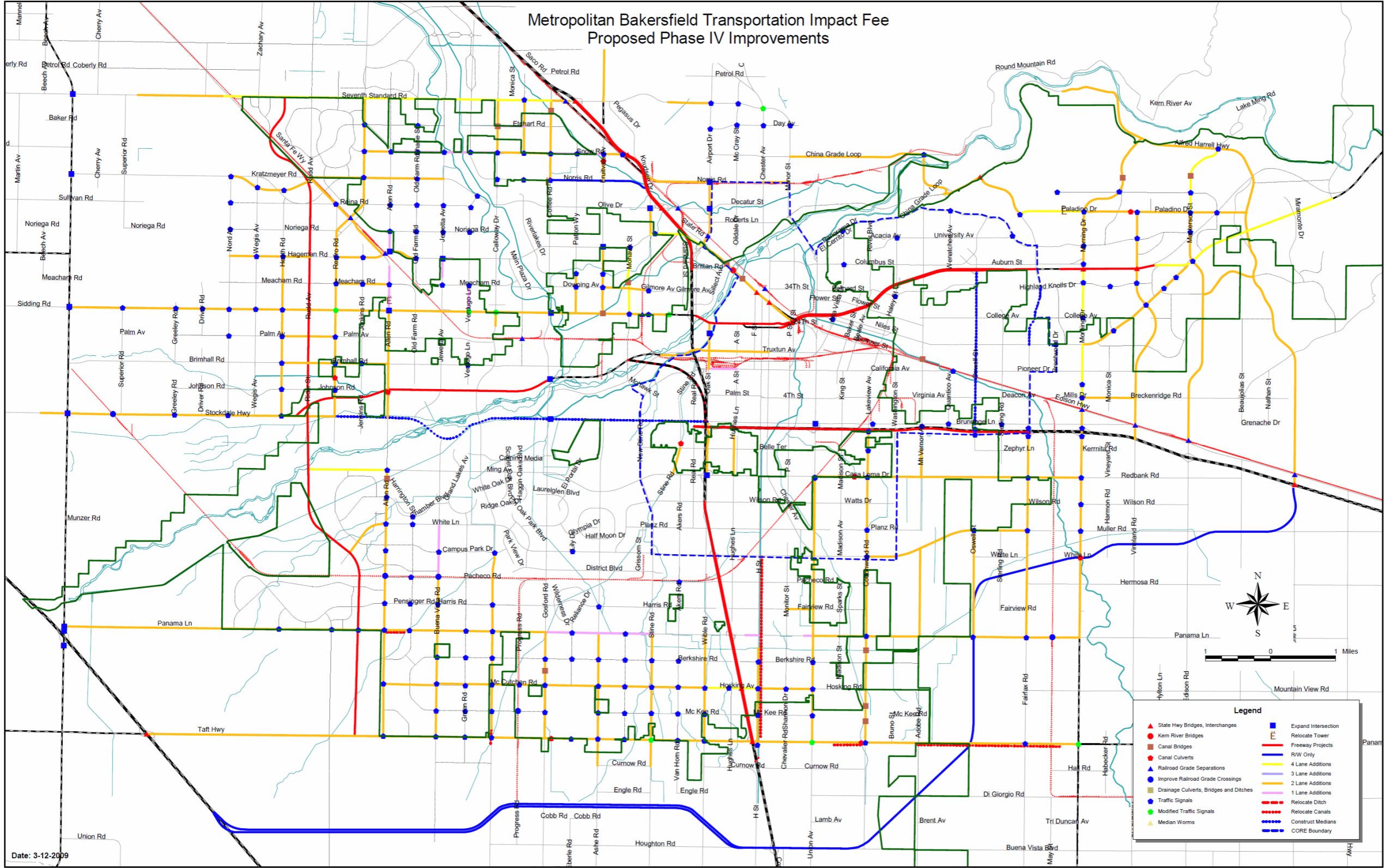
**Figure 3-4:**  
**2011 Regional Transportation Plan,**  
**Amendment #1, Constrained Projects**  
*(2011 to 2035)*

Table 3-3. 2011 Regional Transportation Plan, Amendment #1, Regional Roadway Project List (2010 to 2035)

TABLE 4.1 - Constrained Program of Projects					
2011 through 2015 - Major Highway Improvements					
Project	Location		YOE Cost	Project ID	Start
Route 14	Inyokern	Redrock / Inyokern Rd to Rt 178 - widen to four lanes (Phase1)	42,000,000	KER08RTP006	2014
Route 46	Lost Hills	SLO County Line to Brown Material Rd - widen to four lanes (Phases 1 -3)	232,070,000	KER08RTP003	2009
Route 58	Metro Bkfd	Rosedale Hwy - Calloway Dr to Rt 99 - widen existing highway	24,226,000	KER08RTP007	2013
Route 58	Metro Bkfd	Rosedale Hwy - Allen Rd to Calloway Dr - widen existing highway	8,800,000	KER08RTP090	2013
Route 58	Bakersfield	Rt 99 to Cottonwood Rd. - widen to six lanes	50,000,000	KER08RTP019	2015
Route 99	Metro Bkfd	Hosking Ave - construct interchange	35,000,000	KER08RTP009	2014
Route 99	Bakersfield	Wilson Rd to Rt 119 - widen to eight lanes	52,000,000	KER08RTP077	2012
Route 99	Bakersfield	Olive Drive - construct interchange upgrades	6,100,000	KER08RTP091	2012
Route 99	Bakersfield	Rt 204 to 7th Standard Rd - widen to eight lanes (Phase 1)	12,000,000	KER08RTP104	2012
Route 99	Delano	Woollomes Ave - construct interchange upgrades	5,000,000	KER08RTP114	2010
Route 178	Bakersfield	Morning Dr to Vineland Rd - new interchange with freeway	58,800,000	KER08RTP010	2013
Route 178	Bakersfield	Vineland Rd to east of Miramonte Dr - widen existing highway	50,000,000	KER08RTP011	2014
Challenger Dr. Ext.	Tehachapi	Viena St to Dennison Rd - construct new street	1,500,000	KER08RTP015	2011
W Ridgecrest Blvd	Ridgecrest	Mahan St to China Lake Blvd - widen to four lanes	10,200,000	KER08RTP001	2011
Westside Parkway	Metro Bkfd	Rt 99 / Oak St to Heath Rd - construct local freeway	340,000,000	KER08RTP004	2009
Hageman Flyover	Bakersfield	Knudsen Dr to Rt 204 - construct extension	68,900,000	KER08RTP013	2013
Hageman Grade Sep	Metro Bkfd	Hageman/Santa Fe Way @ BNSF - construct grade separation	39,500,000	KER08RTP117	2011
Oak St/24th Street	Bakersfield	Rt 178 (24th St) and Oak St - construct improvements	19,100,000	KER08RTP012	2012
Centennial Corridor	Bakersfield	I-5 to Rt-58/99 - element of the Bakersfield Beltway System - construct new freeway and/or operational improvements	645,000,000	KER08RTP020	2015
24th Street	Bakersfield	Rt 178 (24th and 23rd St) Oak St to M Street - widen existing highway	34,000,000	KER08RTP014	2013
Sub-total			\$1,734,196,000		
2016 through 2020 - Major Highway Improvements					
Project	Location	Scope	YOE Cost	Project ID	Start
Route 14	Inyokern	Redrock / Inyokern Rd to Rt 178 - widen to four lanes (Phase 2)	42,000,000	KER08RTP017	2018
Sub-total			\$42,000,000		
2021 through 2025 - Major Highway Improvements					
Project	Location	Scope	YOE Cost	Project ID	Start
Route 14	Inyokern	Redrock / Inyokern Rd to Rt 178 - widen to four lanes (Phase 3)	\$32,000,000	KER08RTP024	2022
Route 58	Bakersfield	Rosedale Hwy - Rt 43 to Allen Rd - widen existing highway	59,000,000	KER08RTP092	2025
Route 58	Metro Bkfd	Rosedale Hwy @ Minkler Spur / Landco - construct grade separation	27,000,000	KER08RTP118	2025
Route 58	Bakersfield	Rt 99 to Cottonwood Rd - widen to eight lanes	47,400,000	KER08RTP093	2025
Route 65	Bakersfield	James Rd to Merle Haggard Dr - widen to four lanes	3,000,000	KER08RTP094	2021
Route 119	Taft	Cherry Ave to Elk Hills Rd (Phase 1, bypass) - widen to four lanes	115,000,000	KER08RTP022	2022
Route 178	Bakersfield	At Rt 204 - construct interchange	25,700,000	KER08RTP095	2025
Route 184	Bakersfield	At Union Pacific Railroad - construct grade separation	26,400,000	KER08RTP108	2025
US 395	Ridgecrest	Between Rt 178 and China Lake Blvd - construct passing lanes	20,000,000	KER08RTP089	2022
7th Standard Rd	Shafter/Bkfd	Rt 43 to Santa Fe Way - widen existing roadway	14,000,000	KER08RTP113	2025
West Beltway	Metro Bkfd	Rosedale Hwy to Westside Parkway - construct new facility	93,500,000	KER08RTP016	2025
Sub-total			\$463,000,000		

Source: Kern Council of Governments 2011 Regional Transportation Plan, Amendment #1; regionally adopted May 19, 2011; federally approved June 2, 2011

2026 through 2030 - Major Highway Improvements					
Project	Location	Scope	YOE Cost	Project ID	Start
Route 46	Lost Hills	Brown Material Rd to I-5 - interchange upgrade at I-5 (Phase 4)	\$97,000,000	KER08RTP018	2026
Route 119	Bakersfield	I-5 to Buena Vista - widen to four lanes	31,300,000	KER08RTP099	2026
Route 178	Metro Bkfd	West of Fairfax Rd to Vineland Rd - widen existing freeway	17,000,000	KER08RTP111	2028
Route 178	Bakersfield	Existing west terminus to Oswell St - widen to eight lanes	140,500,000	KER08RTP026	2026
Route 184	Bakersfield	Panama Rd to Rt 58 - widen to four lanes	10,500,000	KER08RTP100	2029
Route 184	Bakersfield	Morning Dr to Rt 178 - widen to four lanes	5,000,000	KER08RTP101	2026
Route 204	Bakersfield	Airport Drive to Rt 178 - widen existing highway	55,000,000	KER08RTP083	2030
Route 204	Bakersfield	F St - construct interchange	36,000,000	KER08RTP081	2030
Sub-total			\$392,300,000		
2031 through 2035 - Major Highway Improvements					
Project	Location	Scope	YOE Cost	Project ID	Start
Route 58	Bakersfield	At various locations - ramp improvements	\$32,600,000	KER08RTP103	2033
Route 99	Bakersfield	At Olive Drive - reconstruct interchange	108,000,000	KER08RTP021	2033
Route 99	Bakersfield	At Snow Rd - construct new interchange	138,200,000	KER08RTP115	2033
Route 99	Bakersfield	Rt 204 to 7th Standard Rd - widen to eight lanes (Phase 2)	90,800,000	KER08RTP138	2033
Route 99	Bakersfield	At various locations - ramp improvements	37,000,000	KER08RTP105	2033
Route 119	Taft	Elk Hills - County Rd to Tupman Ave - widen to four lanes (Phase 2)	48,000,000	KER08RTP086	2033
Route 178	Metro Bkfd	Vineland to Miramonte - new interchange; widen existing freeway	119,000,000	KER08RTP025	2033
Route 178	Bakersfield	Miramonte to Rancheria - widen existing highway	19,800,000	KER08RTP084	2033
Route 178	Bakersfield	At Rt 204 and 178 - reconstruct freeway ramps	50,000,000	KER08RTP085	2033
Route 178	Bakersfield	At various locations - ramp improvements	37,000,000	KER08RTP106	2033
Route 184	Lamont	Rt 58 to Rt 178 - widen to four lanes	90,000,000	KER08RTP045	2033
West Beltway	Metro Bkfd	Pacheco Rd to Westside Parkway - construct new facility	115,793,000	KER08RTP139	2033
West Beltway	Metro Bkfd	Rosedale Hwy to 7th Standard Rd - construct new facility	115,793,000	KER08RTP102	2033
West Beltway	Metro Bkfd	Taft Hwy to Pacheco Rd - construct new facility	90,000,000	KER08RTP097	2033
Sub-total			\$1,091,986,000		
Total Major Highway Improvements			\$3,723,482,000		



Adopted by the County of Kern on May 19, 2009 and by the City of Bakersfield on July 7, 2009

**Figure 3-5: Metropolitan Bakersfield  
Transportation Impact Fee—Proposed  
Phase IV Improvements**

### **3.4 Design Year and Opening Year Peak Hour and Daily Traffic Volumes**

Daily, AM and PM peak period traffic forecasts were prepared by Parsons for the design year (2038) and opening year (2018) of the Centennial Corridor project. The traffic forecasts were based on the land use assumptions and demographic conditions discussed in Section 3.2 and the highway network summarized in Section 3.3. Parsons utilized the Kern COG Regional Travel Demand Model to prepare the traffic forecasts. This model was first developed and calibrated in 1998, and has been continually monitored for accuracy and updated since that time. In 2007, Kern COG undertook a comprehensive recalibration of the model based on year 2006 information, as discussed previously in Section 3.1.

For the purpose of the Centennial Corridor project, Parsons prepared a set of year 2006 model validation forecasts and compared these with traffic counts collected along State Route 58, State Route 99, and study area arterial and collector streets. Model validation, in essence, “forecasts” existing conditions based on current estimates of population and employment. Traffic generated from land uses is assigned to the road network and compared with ground traffic counts. Balanced sets of freeway and local street link volumes were next computed from each mainline and street intersection traffic count location. A consensus estimate of existing traffic was then derived based on a convergence of data points.

The consensus estimates of existing traffic volumes were subsequently used as pivot points for adjusting future year traffic volume forecasts on an intersection approach link basis.

The Kern Council of Governments model estimates peak period and off-peak traffic volumes in variable length time slices depending on time of day. For the AM and PM peak time periods, 2-hour or 3-hour forecasts are computed covering 7:00 to 9:00 a.m. and 3:00 to 6:00 p.m. To convert the AM 2-hour forecasts to a single hour, Parsons applied a factor of 55 percent across the board to all freeway mainline and intersection link forecasts. For the PM peak period, Parsons applied a factor of 37 percent to the 3-hour forecasts to derive a single peak hour. While this simplifying assumption reduced the closeness of fit to individual links, it was consistent with methods used for other locally sponsored corridor studies.

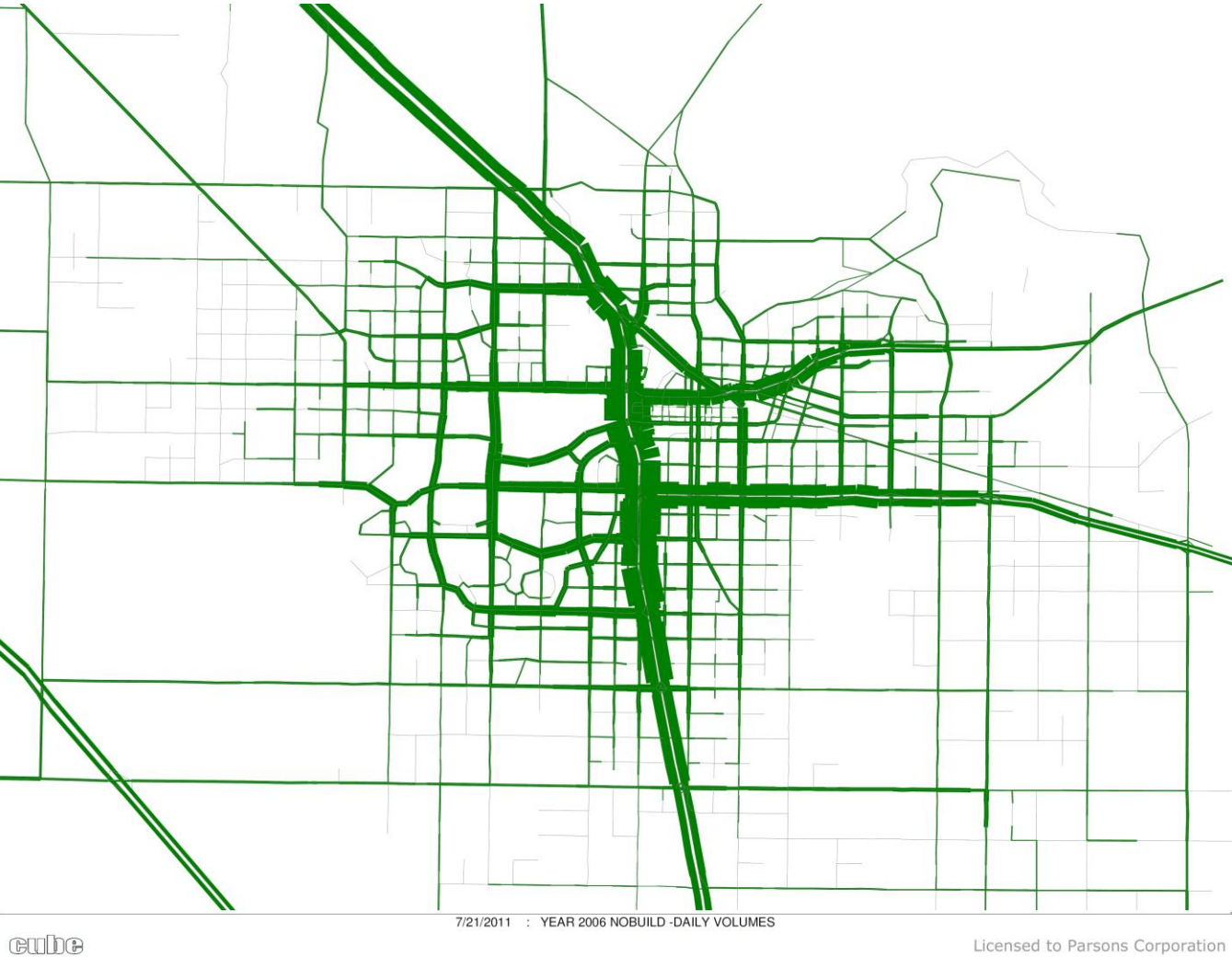
The resulting design year (2038) and opening year (2018) forecasts of weekday peak hour and daily traffic are presented in this section for the four build alternatives (A, B, C and transportation systems management/ transit) and a no-build alternative.

#### ***No-Build Alternative***

The no-build alternative for year 2038 includes all projects identified in Table 3-3 and Figures 3-4 and 3-5 except for the State Route 58 Connector/Centennial Corridor (State Route 58 to Westside Parkway) as identified on Figure 3-4 and Project #22.

Figure 3-6 illustrates the concentration of daily traffic on freeways and major arterial streets. State Route 99, State Route 58 and State Route 178 all attract high volumes of daily traffic. The left portion of Figure 3-6 illustrates the modeled assignment of traffic to the metropolitan Bakersfield highway network as of 2006, whereas the right portion illustrates 2038 forecast conditions, based on the no-build alternative.

2006 Daily Traffic Volumes



Source: Parsons

2038 No-Build Alternative Daily Traffic Volumes

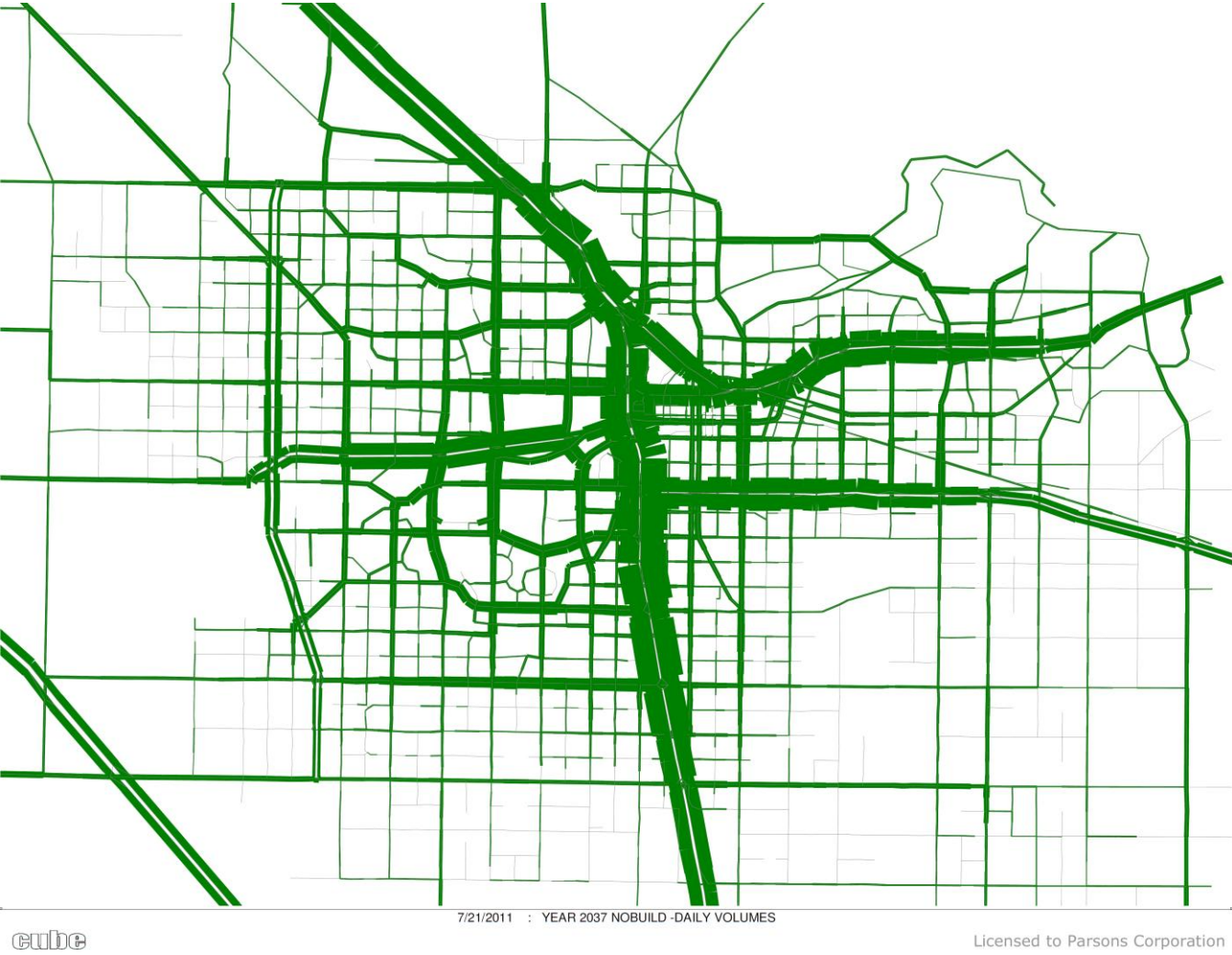


Figure 3-6: Difference between  
Year 2006 and Year 2038  
Daily Traffic Volumes

A comparison of these two graphics clearly illustrates the growth in traffic projected for these state highways along with virtually all other arterial streets within metropolitan Bakersfield. Figure 3-7 depicts the adjusted design year (2038) traffic forecasts for State Route 99, State Route 58 and the Westside Parkway under no-build conditions. Peak hour and daily volumes are reported for all freeway mainline segments and ramps within the study area affected by the Centennial Corridor project.

Figure 3-8 similarly reports the AM and PM peak hour design year (2038) turning movement traffic volumes for all study intersections identified previously in Figure 2-13.

Figures 3-9 and 3-10 present the same traffic volume information for opening year 2018 conditions.

### **Alternative A**

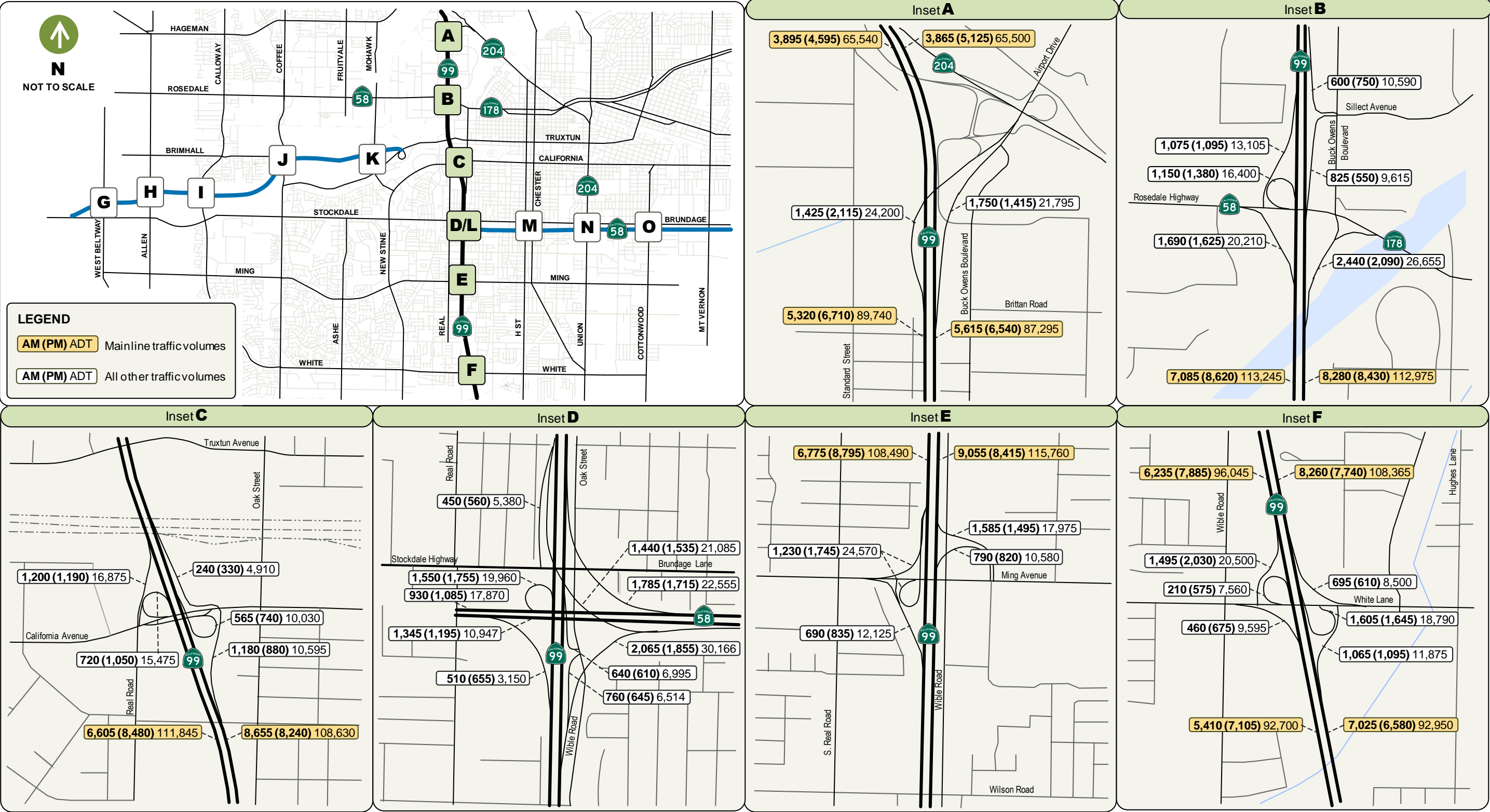
Alternative A proposes to connect the Westside Parkway to State Route 58 east near Cottonwood Road by means of a new freeway. Alternative A would begin at the Westside Parkway in between the Mohawk Street interchange and the Coffee Road interchange and turn in a southeasterly direction. It would then span the Kern River, Truxtun Avenue, Carrier Canal, and Stockdale Highway before joining the existing State Route 58 east at its existing terminus near the State Route 58/State Route 99 interchange. Improvements on State Route 58 would continue to extend through the H Street and Chester Avenue interchange to Cottonwood Road.

State Route 58 would maintain its existing connections to State Route 99 by means of freeway to freeway connectors. The existing westbound State Route 58 to northbound State Route 99 connector, southbound State Route 99 to eastbound State Route 58 connector, and northbound State Route 99 to eastbound State Route 58 would be preserved with modifications. New branch connectors would be constructed for the eastbound State Route 58 to southbound State Route 99, and northbound State Route 99 to westbound State Route 58 movements.

Auxiliary lanes would be provided on State Route 99 to accommodate the additional traffic from these branch connectors. The limits of improvements on State Route 99 would extend from the interchange at State Route 58 to the Wilson Road overcrossing. All ramps in this vicinity would have to be realigned to provide for the additional lanes. The Wible Road on and off ramps south of the existing State Route 99/State Route 58 interchange would be removed to accommodate the northbound State Route 99 on ramp from Ming Avenue. The Stockdale Avenue off ramp from the southbound State Route 99 to the eastbound State Route 58 connector would be removed. Local access from Real Road to State Route 58 and to southbound State Route 99 would also be removed.

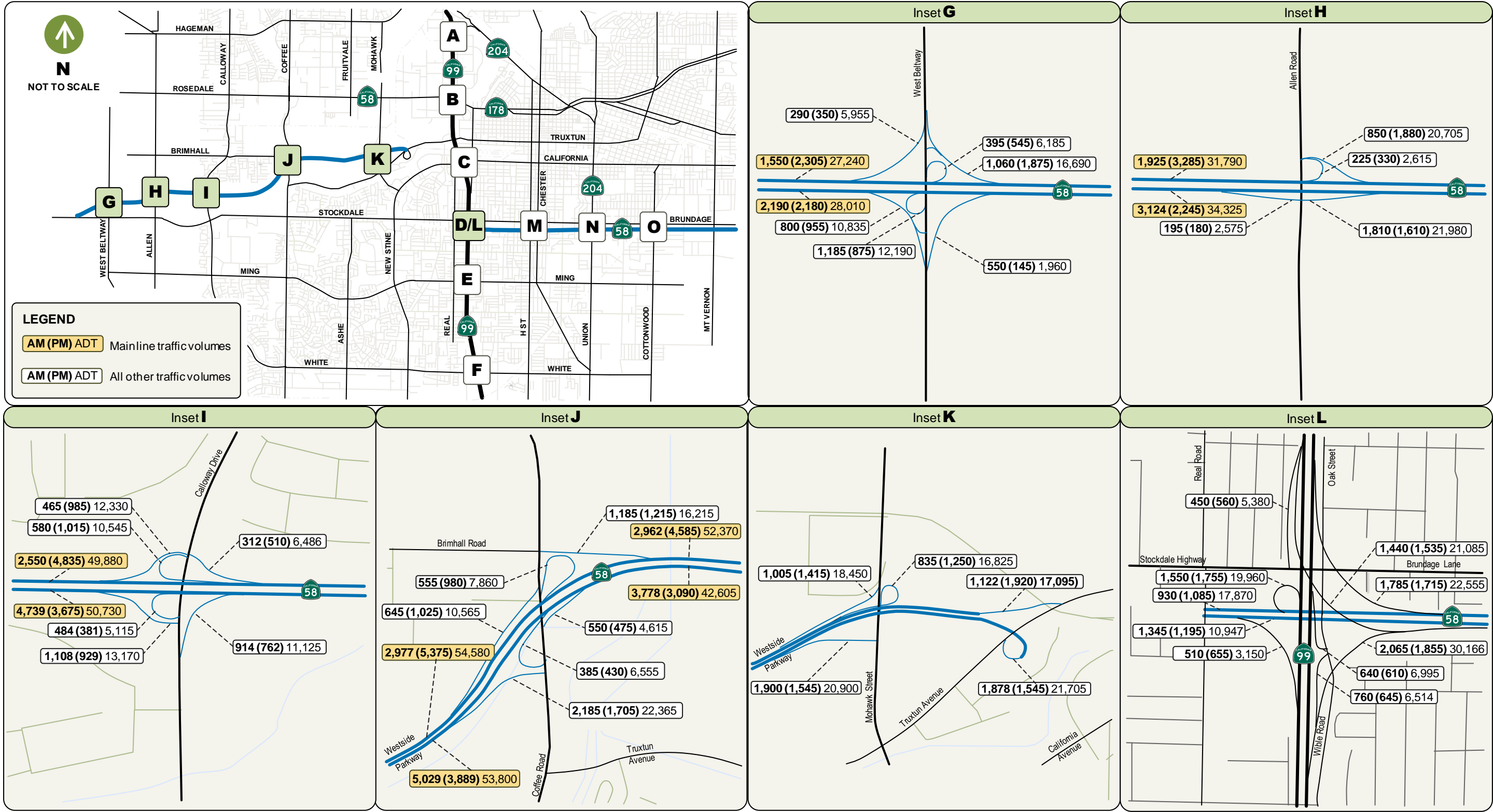
The new freeway would bisect existing business parks and residential neighborhoods. The following roads would cross under or over the proposed freeway alignment:

- Truxtun Avenue
- Lennox Avenue and California Avenue
- Business Center Drive
- Stockdale Highway and Montclair Street
- Stine Road
- South Real Road



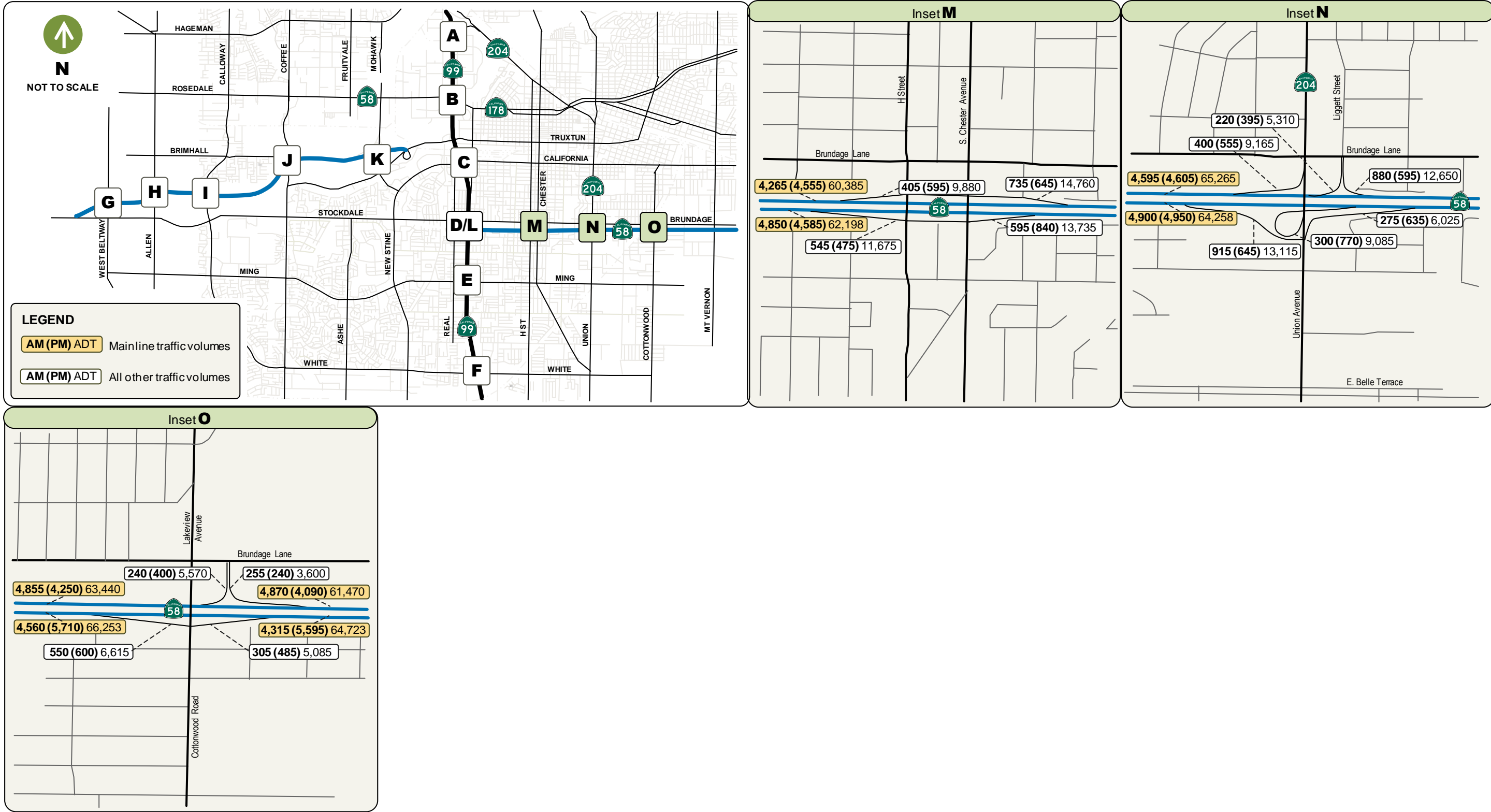
Source: Parsons

Figure 3-7:  
Year 2038 Peak Hour and Daily Freeway  
Volumes—No-Build Alternative  
(1 of 3)



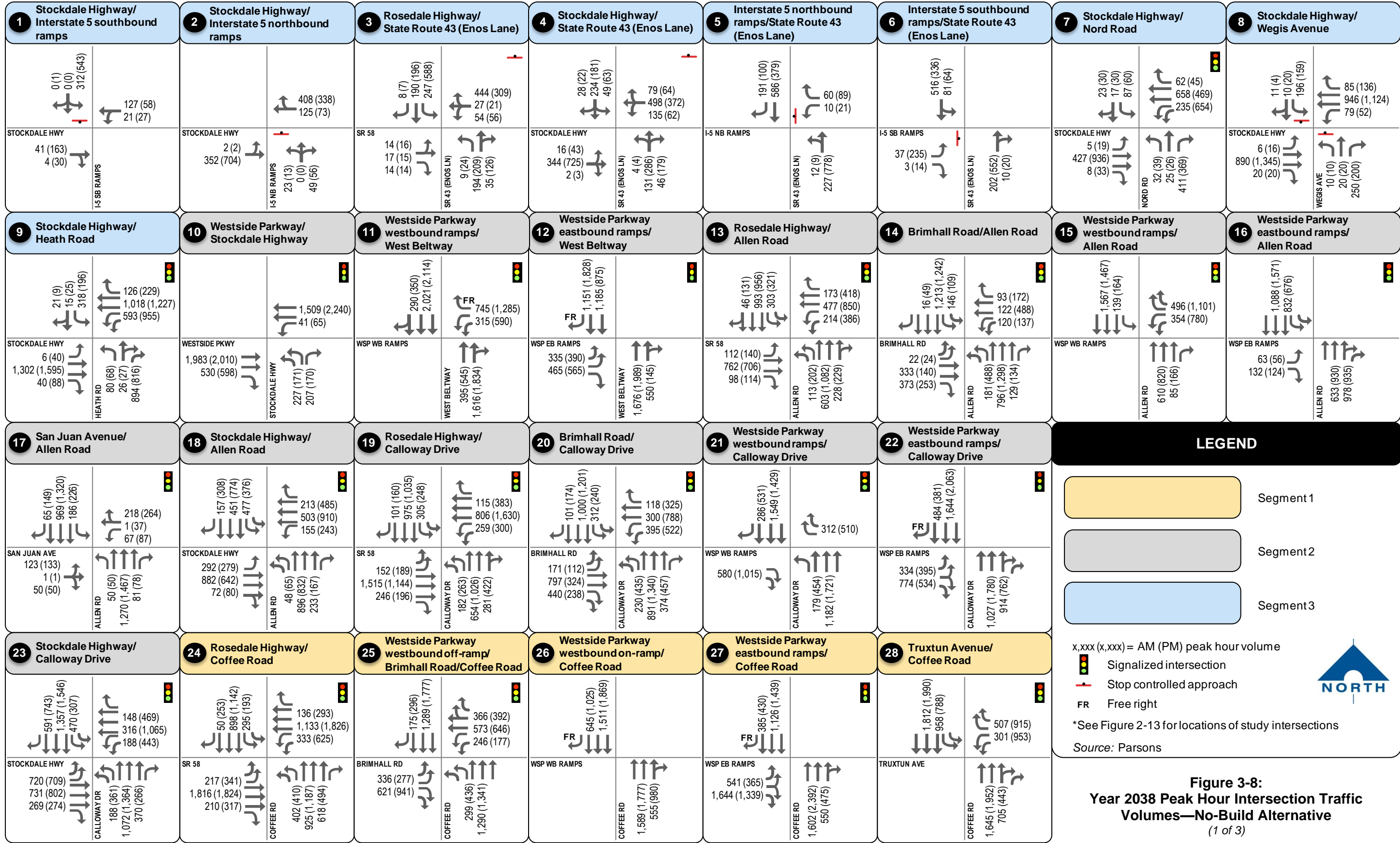
Source: Parsons

Figure 3-7:  
Year 2038 Peak Hour and Daily Freeway  
Volumes—No-Build Alternative  
(2 of 3)

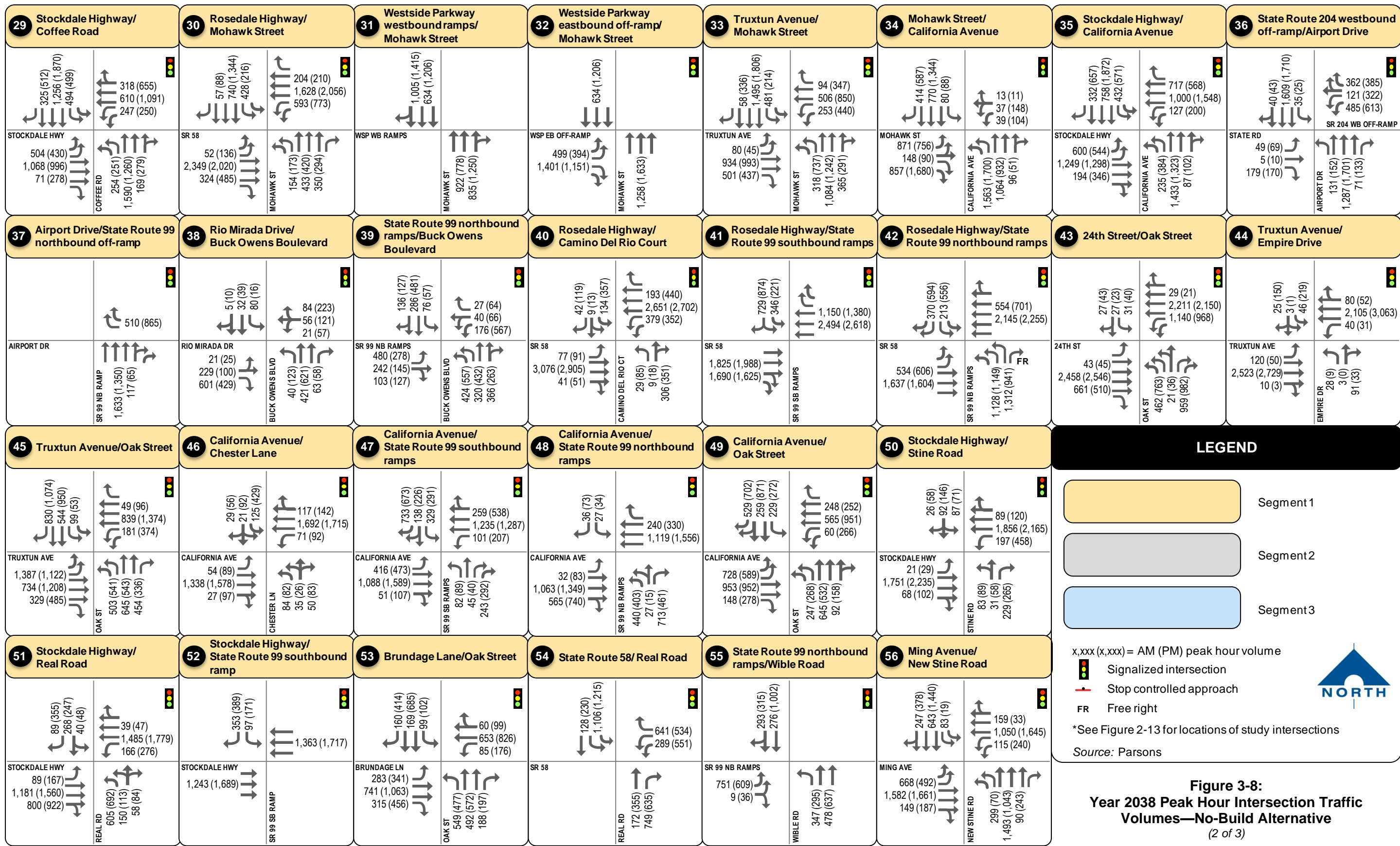


Source: Parsons

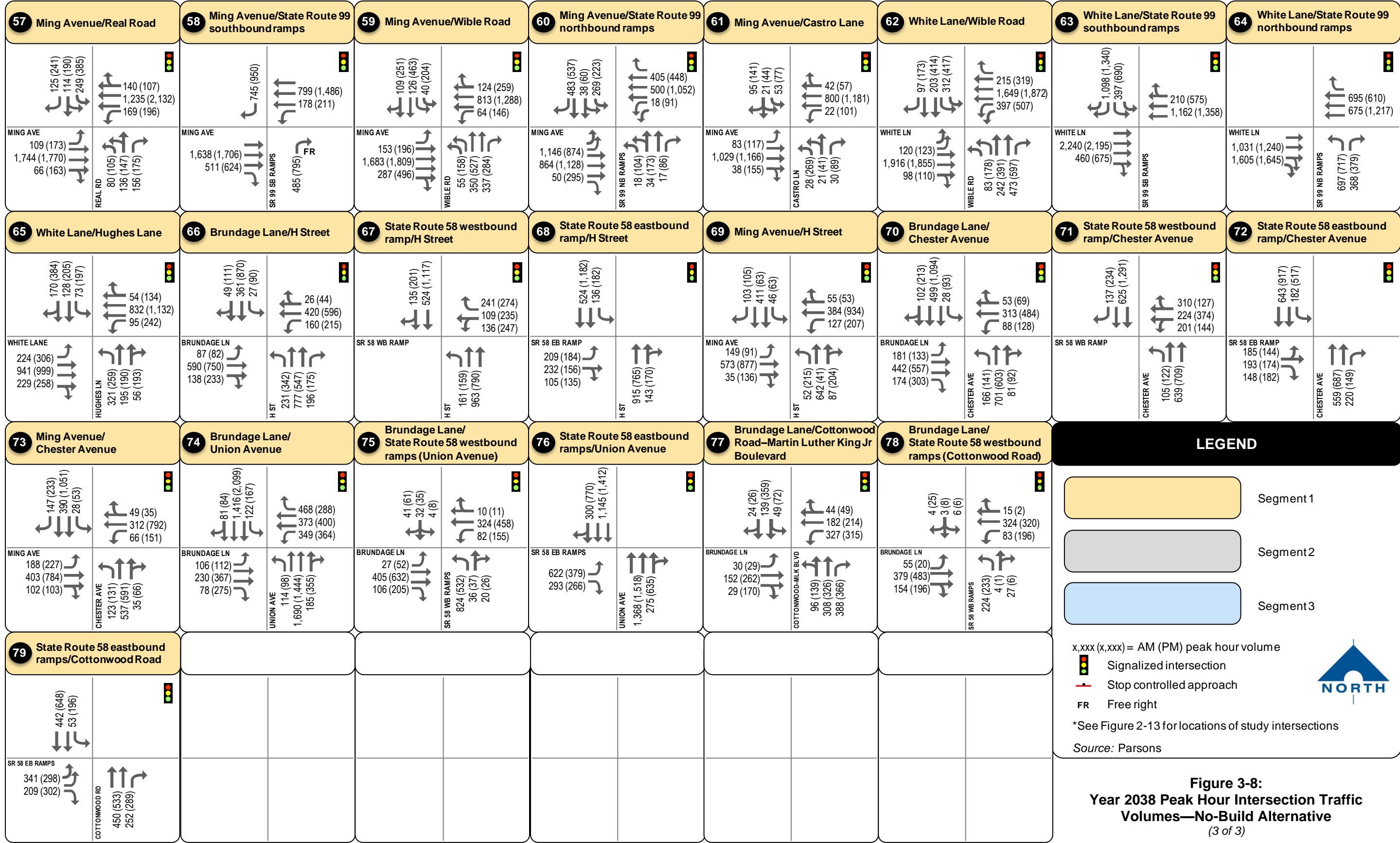
Figure 3-7:  
Year 2038 Peak Hour and Daily Freeway  
Volumes—No-Build Alternative  
(3 of 3)



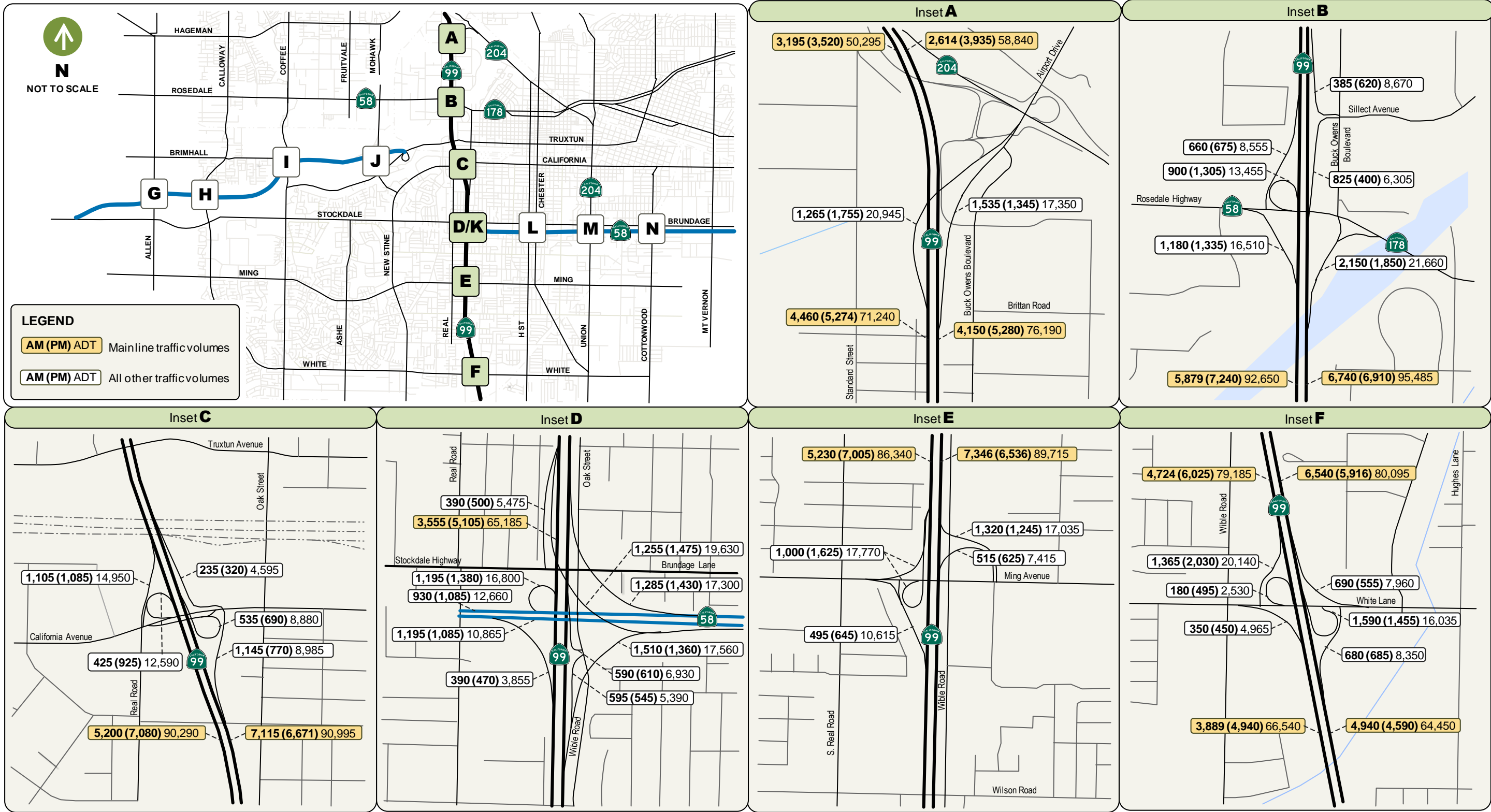
**Figure 3-8:**  
**Year 2038 Peak Hour Intersection Traffic**  
**Volumes—No-Build Alternative**  
(1 of 3)



**Figure 3-8:**  
**Year 2038 Peak Hour Intersection Traffic**  
**Volumes—No-Build Alternative**  
(2 of 3)

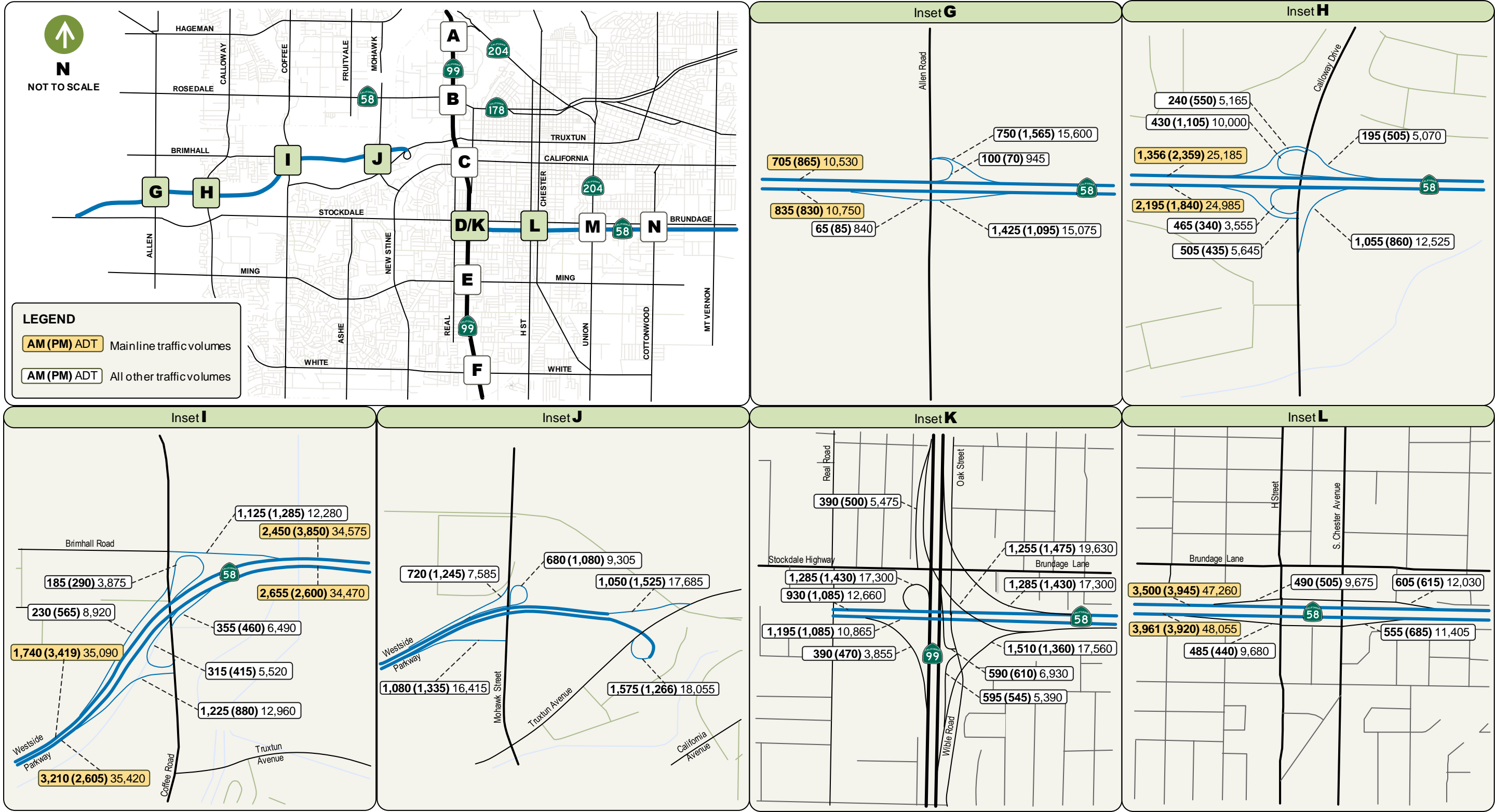


**Figure 3-8:**  
**Year 2038 Peak Hour Intersection Traffic**  
**Volumes—No-Build Alternative**  
(3 of 3)



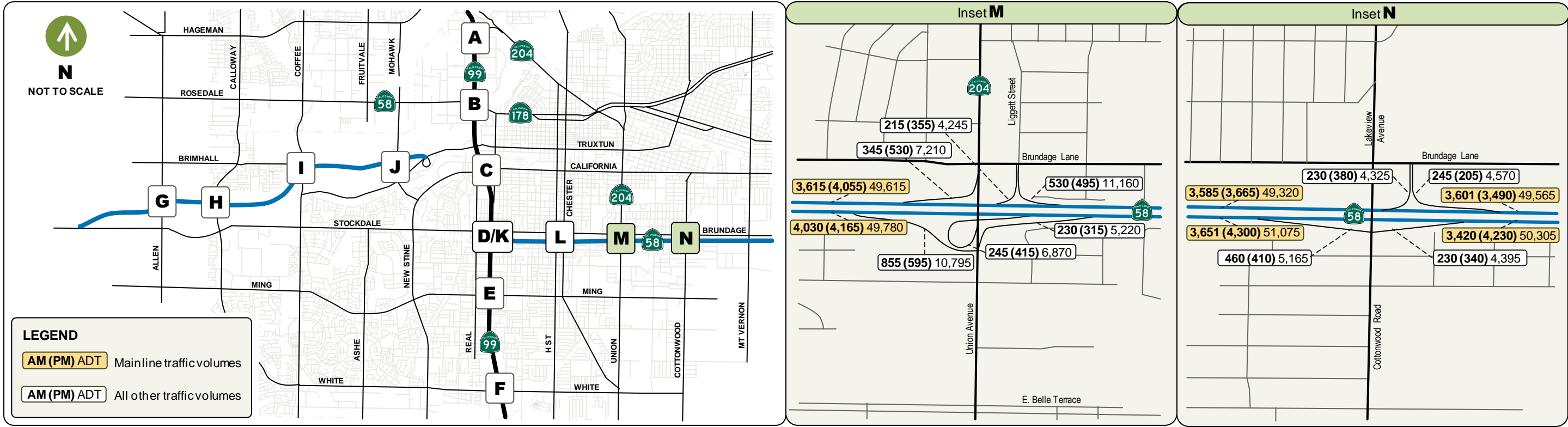
Source: Parsons

Figure 3-9:  
Year 2018 Peak Hour and Daily Freeway  
Volumes—No-Build Alternative  
(1 of 3)



Source: Parsons

Figure 3-9:  
Year 2018 Peak Hour and Daily Freeway  
Volumes—No-Build Alternative  
(2 of 3)



Source: Parsons

Figure 3-9:  
Year 2018 Peak Hour and Daily Freeway  
Volumes—No-Build Alternative  
(3 of 3)

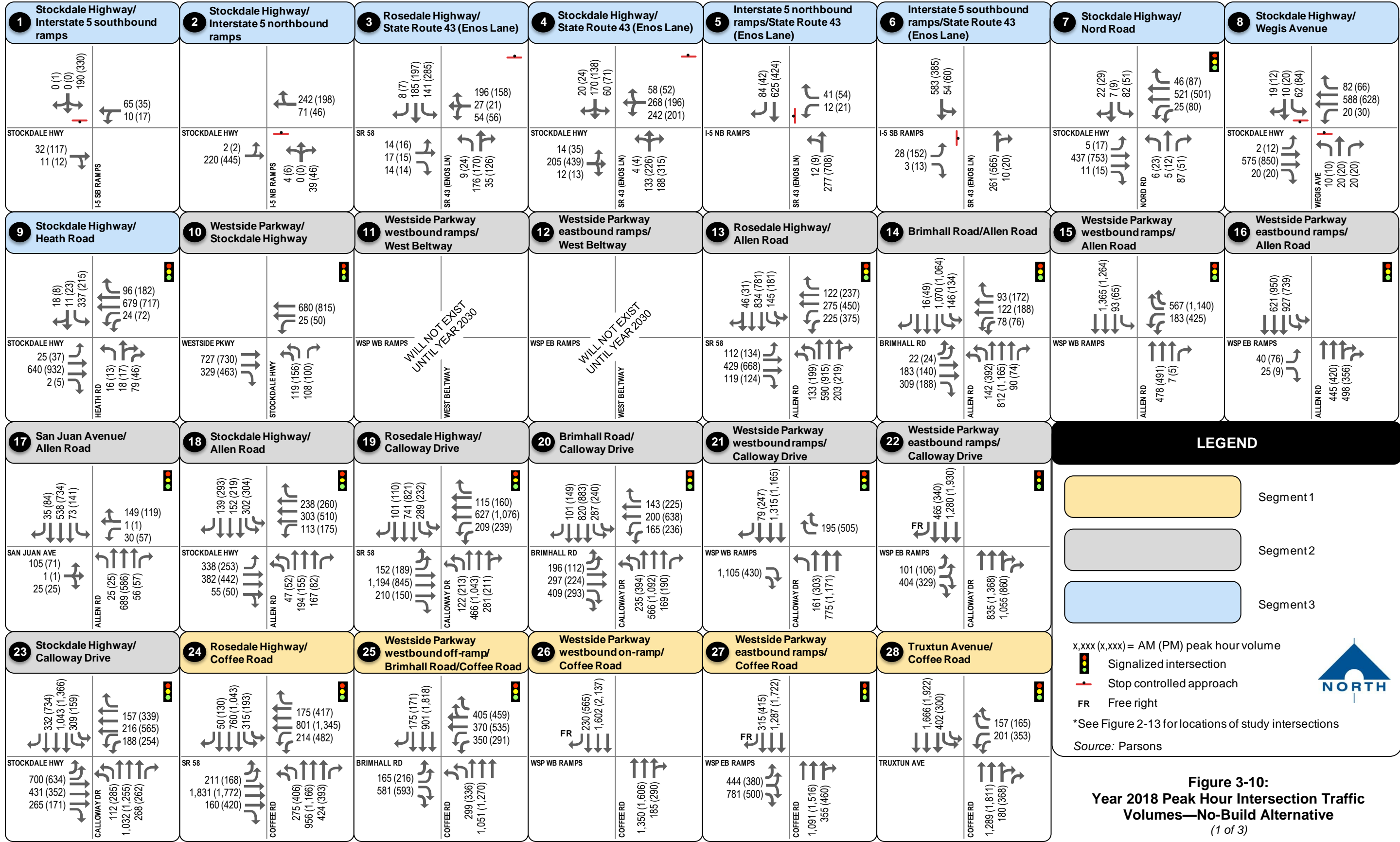


Figure 3-10:  
Year 2018 Peak Hour Intersection Traffic  
Volumes—No-Build Alternative  
(1 of 3)

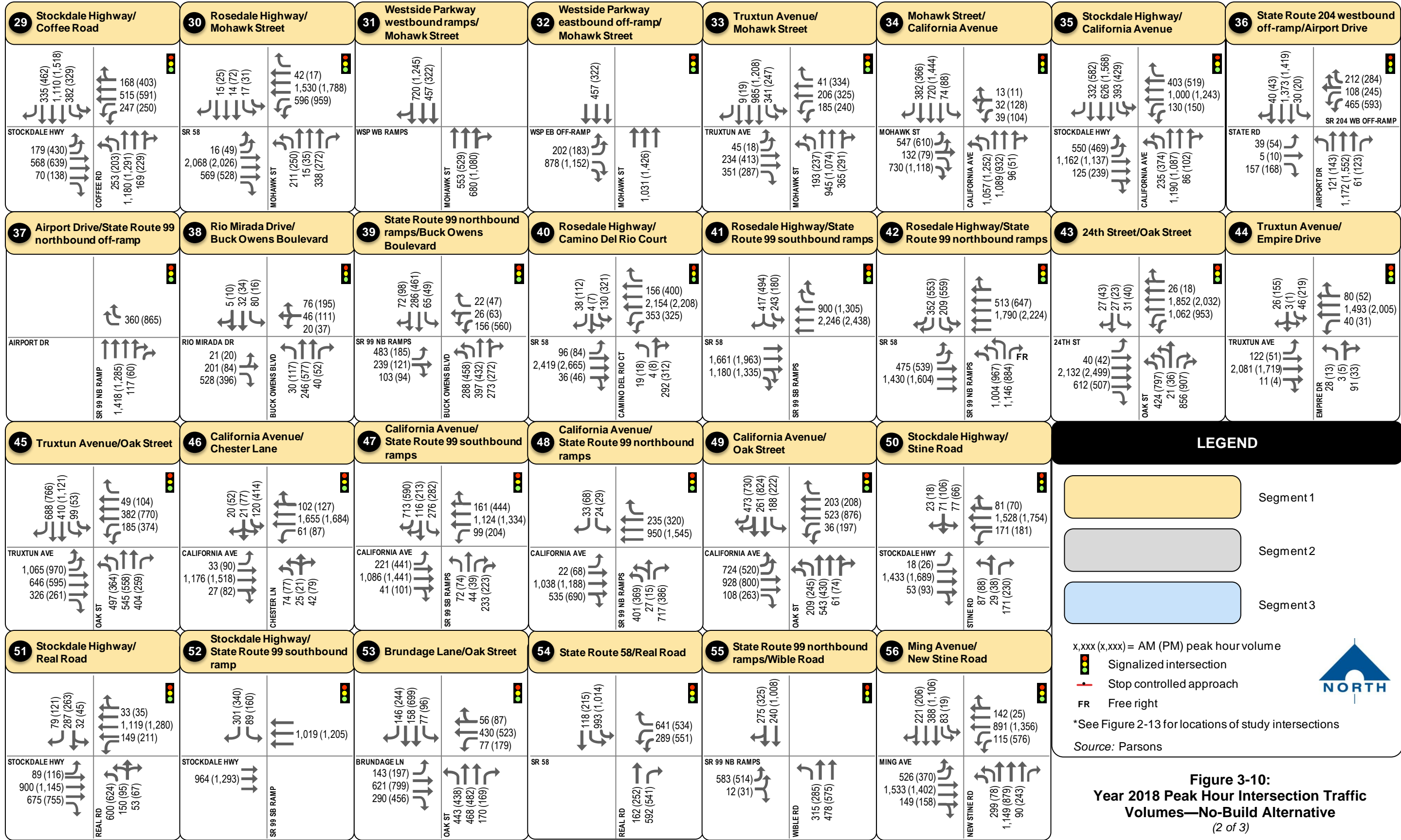


Figure 3-10:  
Year 2018 Peak Hour Intersection Traffic  
Volumes—No-Build Alternative  
(2 of 3)

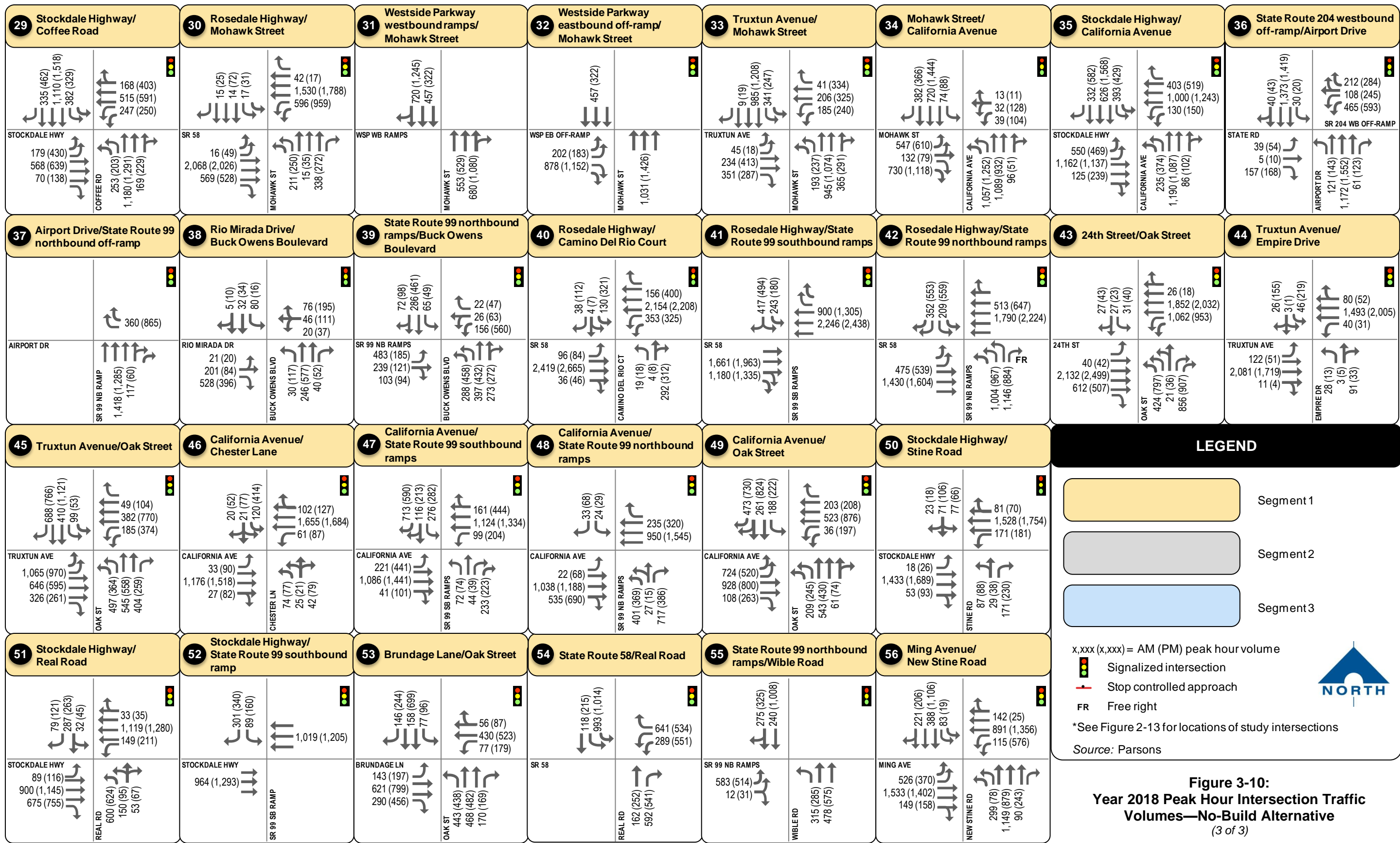


Figure 3-10:  
Year 2018 Peak Hour Intersection Traffic  
Volumes—No-Build Alternative  
(3 of 3)

The potential closure of Frazier Avenue, Westwood Way, McDonald Way, Curran Street, Griffith Street, Jones Street and Williamson Way would modify existing circulation. Pedestrian and bicycle crossing would be limited to the proposed undercrossings, increasing neighborhood travel distances. No Golden Empire Transit District (GET) bus routes use the roads that would potentially be closed. Therefore, alternative A would not directly affect existing transit service.

To provide an overall indication of the impact of constructing the Westside Parkway to State Route 58 east connector along the alternative A alignment, a computer generated map is provided as Figure 3-11, which illustrates the difference between the 2038 alternative A and no-build daily traffic volumes, as assigned by the travel forecast model. The bandwidths illustrated in red depict roadways which receive additional volumes of traffic as a result of constructing the freeway-to-freeway connector. Roadways having bandwidths illustrated in blue indicate roadways receiving less traffic as a result of building the freeway connector. The difference plot clearly indicates that alternative A attracts more traffic volume to State Route 58/Westside Parkway while reducing traffic on parallel roadways.

Figure 3-12 depicts the adjusted design year (2038) traffic forecasts for State Route 99 and State Route 58/Westside Parkway under alternative A conditions. Peak hour and daily volumes are reported for all freeway mainline segments and ramps within the Centennial Corridor project study area.

Figure 3-13 reports AM and PM peak hour design year (2038) turning movement volumes for all study intersections.

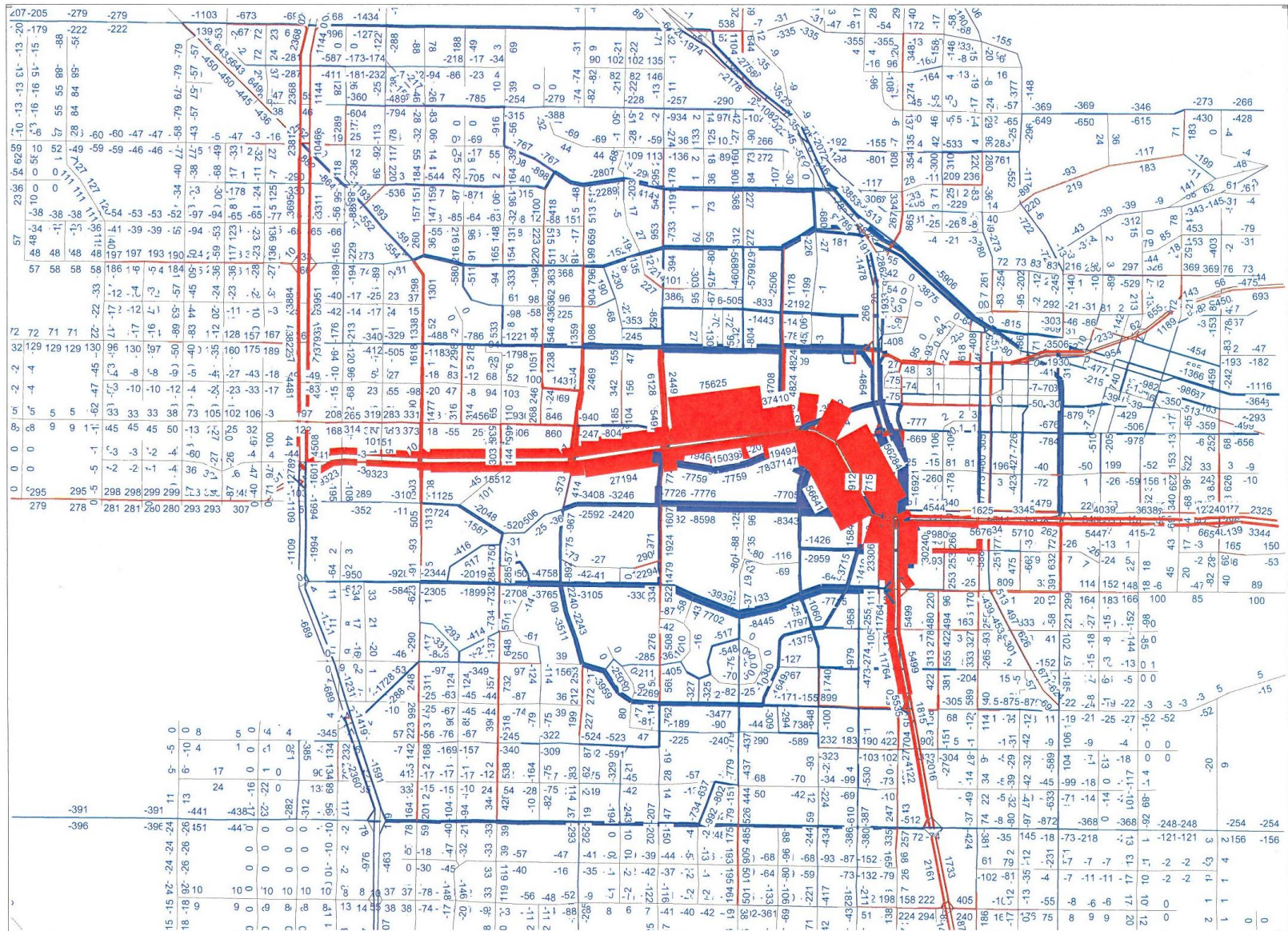
Figures 3-14 and 3-15 present the same traffic volume information for opening year 2018 conditions.

### **Alternative B**

Alternative B proposes to connect the east end of the Westside Parkway to State Route 58 east near Cottonwood Road by means of a new freeway. This proposed alternative would begin at the Mohawk Street interchange and turn in a southeasterly direction. It would span the Kern River, Truxtun Avenue, Carrier Canal, California Avenue and Stockdale Highway before joining the existing State Route 58 east at its existing terminus near the State Route 58/State Route 99 interchange. Improvements on State Route 58 would continue to extend through the H Street and Chester Avenue interchange to Cottonwood Road.

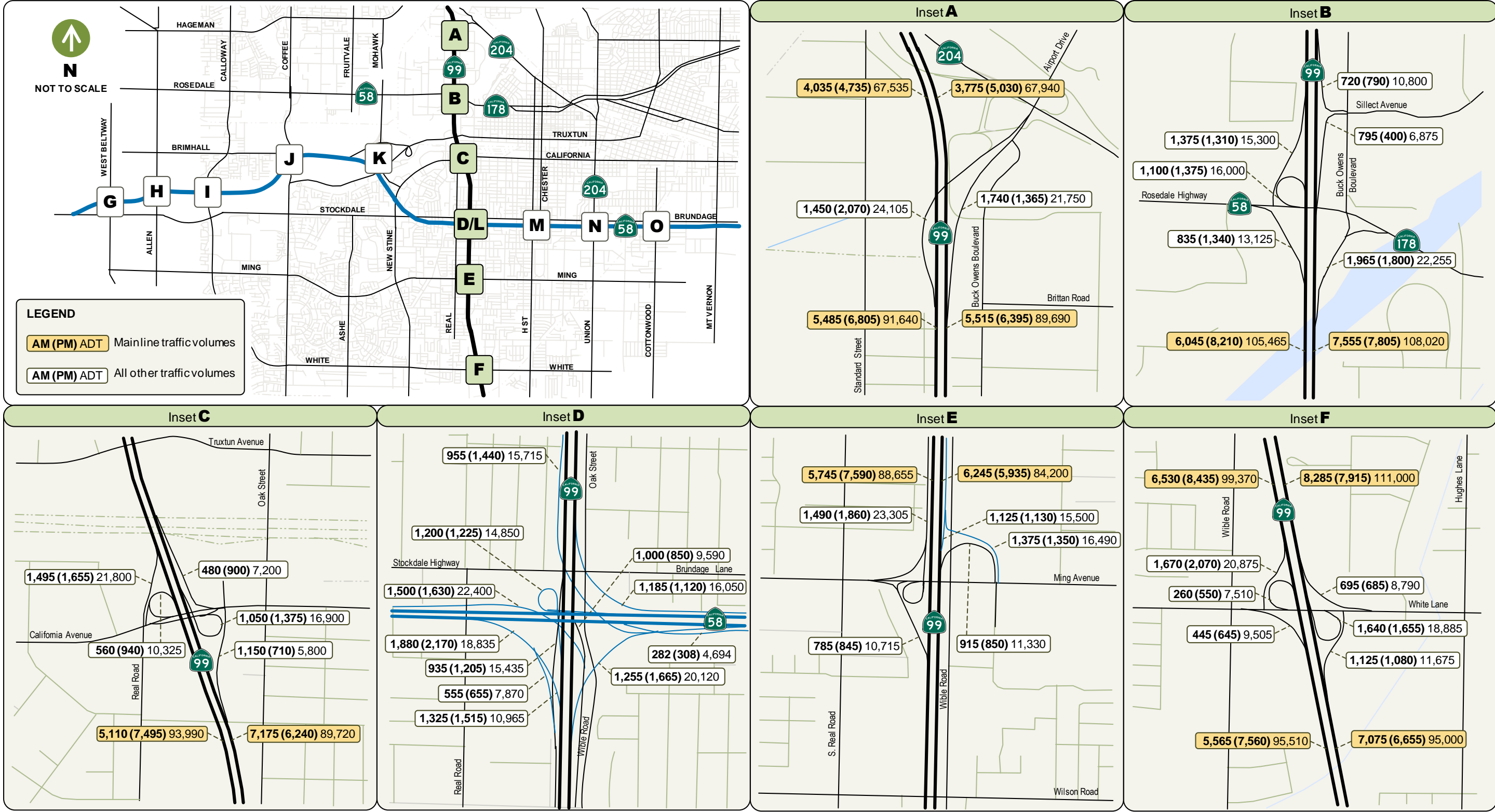
State Route 58 would maintain its existing connections to State Route 99 by means of freeway to freeway connectors. The existing westbound State Route 58 to northbound State Route 99 connector, southbound State Route 99 to eastbound State Route 58 connector, and northbound State Route 99 to eastbound State Route 58 would be preserved with modifications. New branch connectors would be constructed for the eastbound State Route 58 to southbound State Route 99, and northbound State Route 99 to westbound State Route 58 movements.

Auxiliary lanes would be provided on State Route 99 to accommodate the additional traffic from these branch connectors. The limits of improvements on State Route 99 would extend from the interchange at State Route 58 to the Wilson Road overcrossing. All ramps in this vicinity would have to be realigned to provide for the additional lanes. The Wible Road on and off ramps south of the existing State Route 99/State Route 58 interchange would be removed to accommodate the northbound State Route 99 on ramp from Ming Avenue. The Stockdale Avenue off ramp from



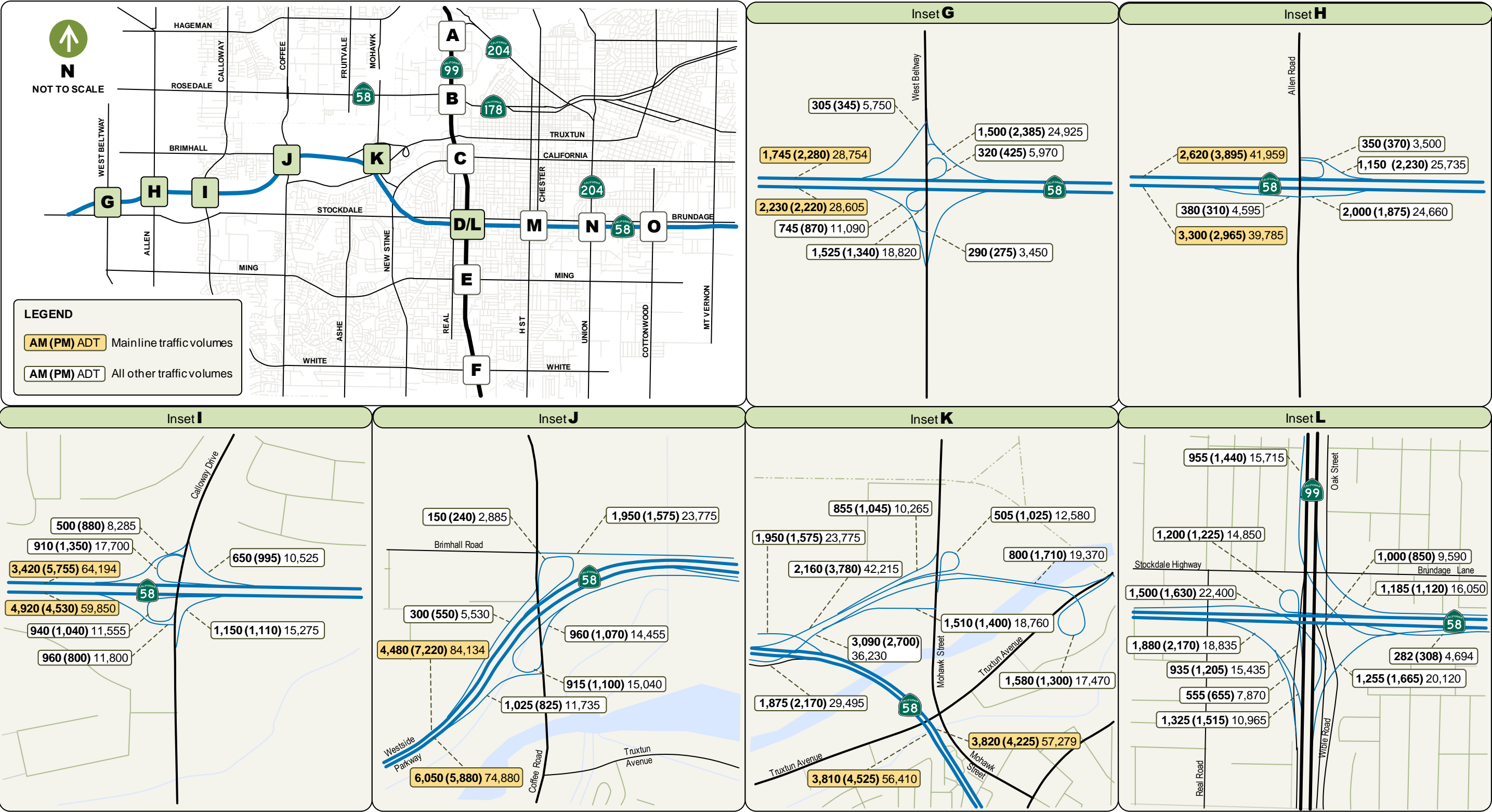
Source: Parsons

Figure 3-11: Difference between Year 2038 Alternative A and the No-Build Alternative Daily Traffic Volumes



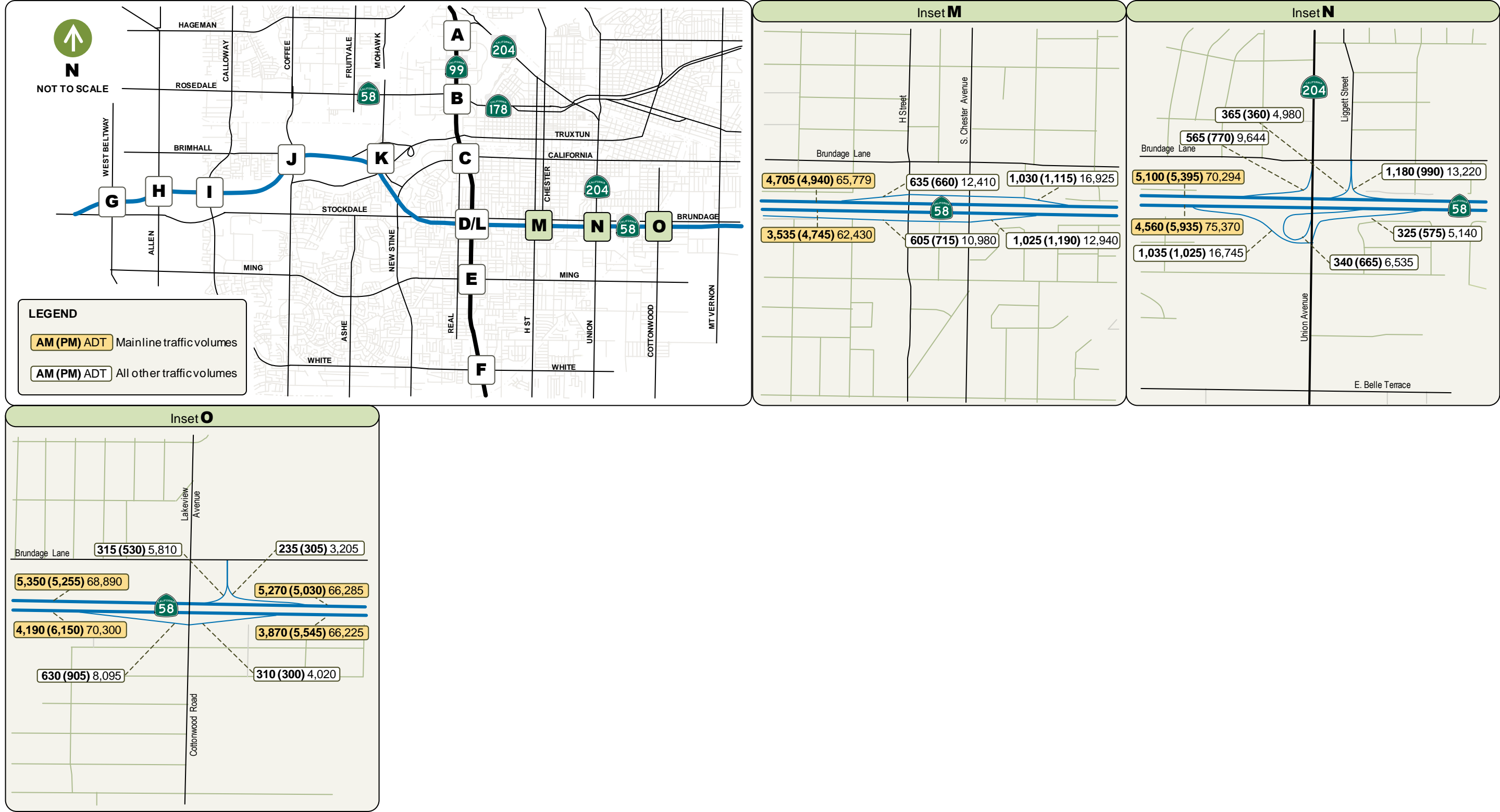
Source: Parsons

Figure 3-12:  
Year 2038 Peak Hour and Daily Freeway  
Volumes—Alternative A  
(1 of 3)



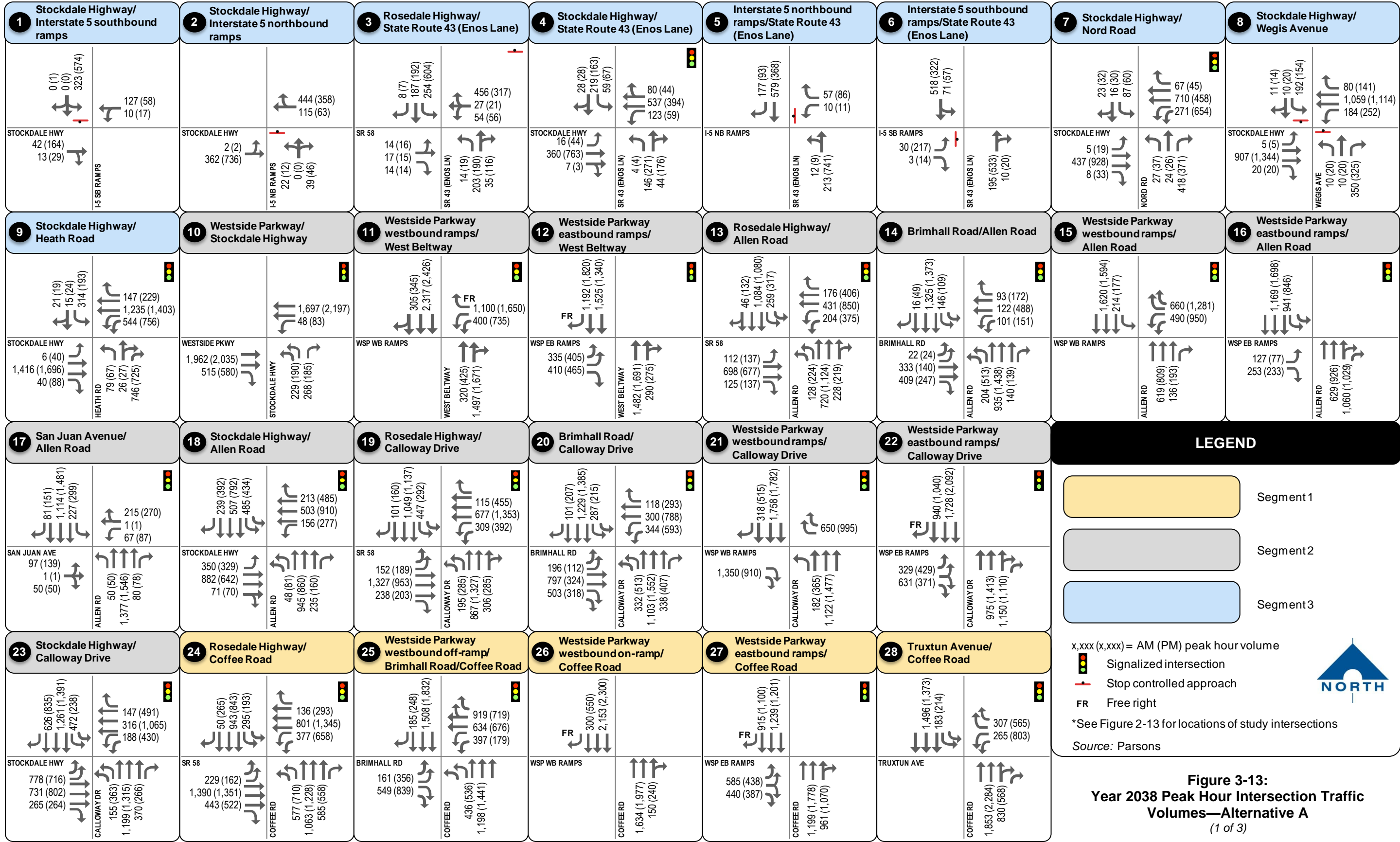
Source: Parsons

Figure 3-12:  
Year 2038 Peak Hour and Daily Freeway  
Volumes—Alternative A  
(2 of 3)



Source: Parsons

Figure 3-12:  
Year 2038 Peak Hour and Daily Freeway  
Volumes—Alternative A  
(3 of 3)



**Figure 3-13:**  
**Year 2038 Peak Hour Intersection Traffic**  
**Volumes—Alternative A**  
(1 of 3)

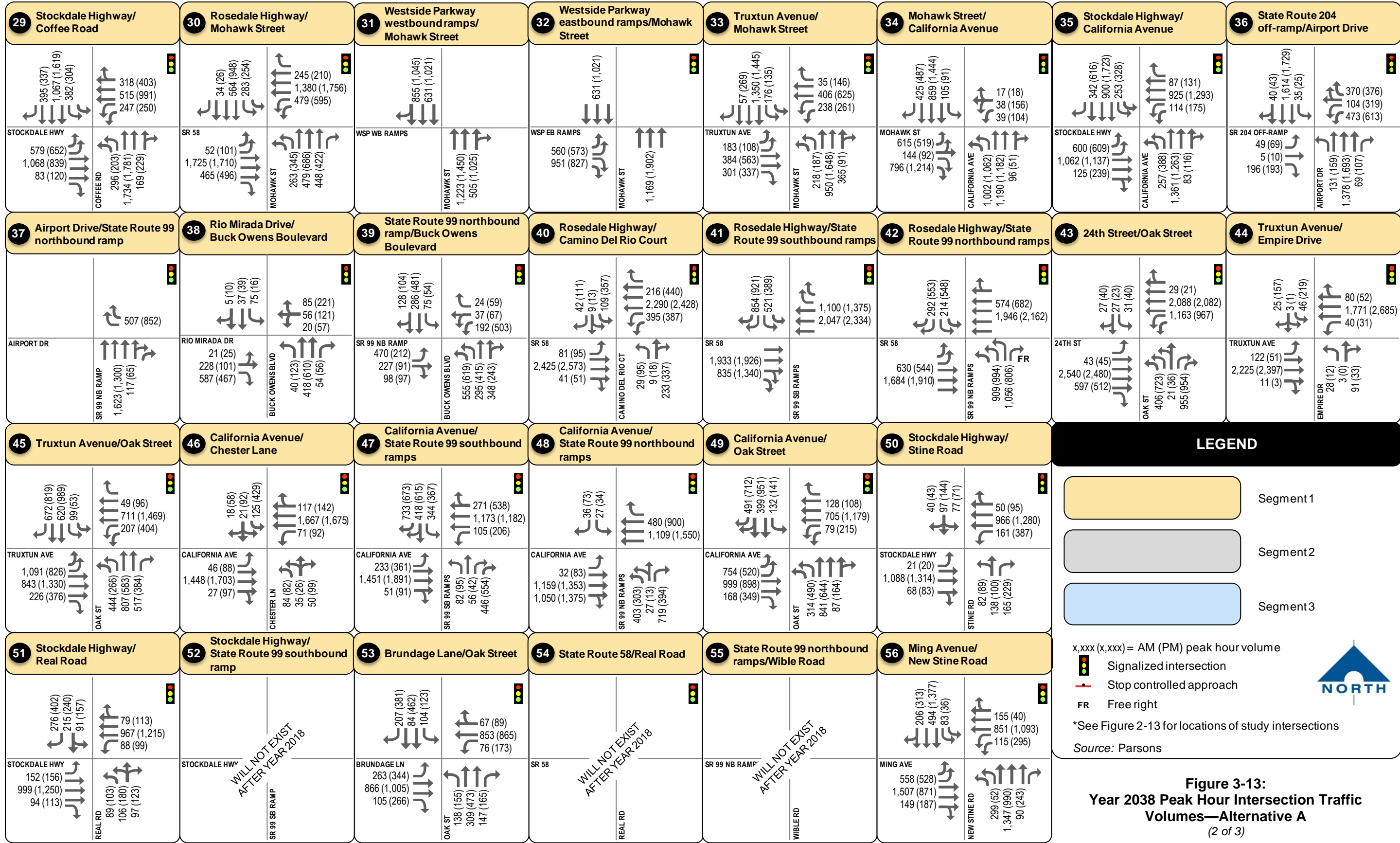


Figure 3-13:  
Year 2038 Peak Hour Intersection Traffic  
Volumes—Alternative A  
(2 of 3)

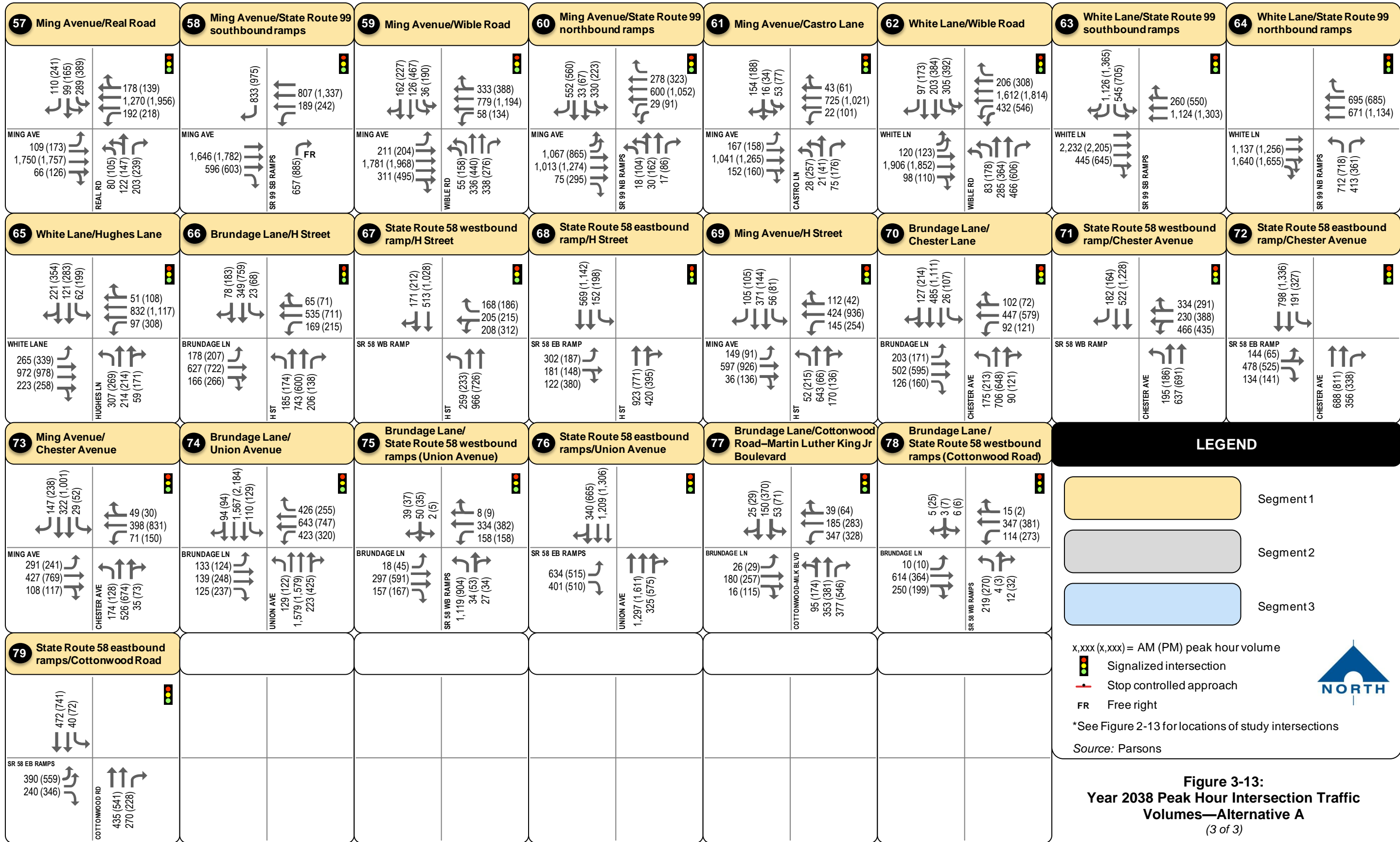
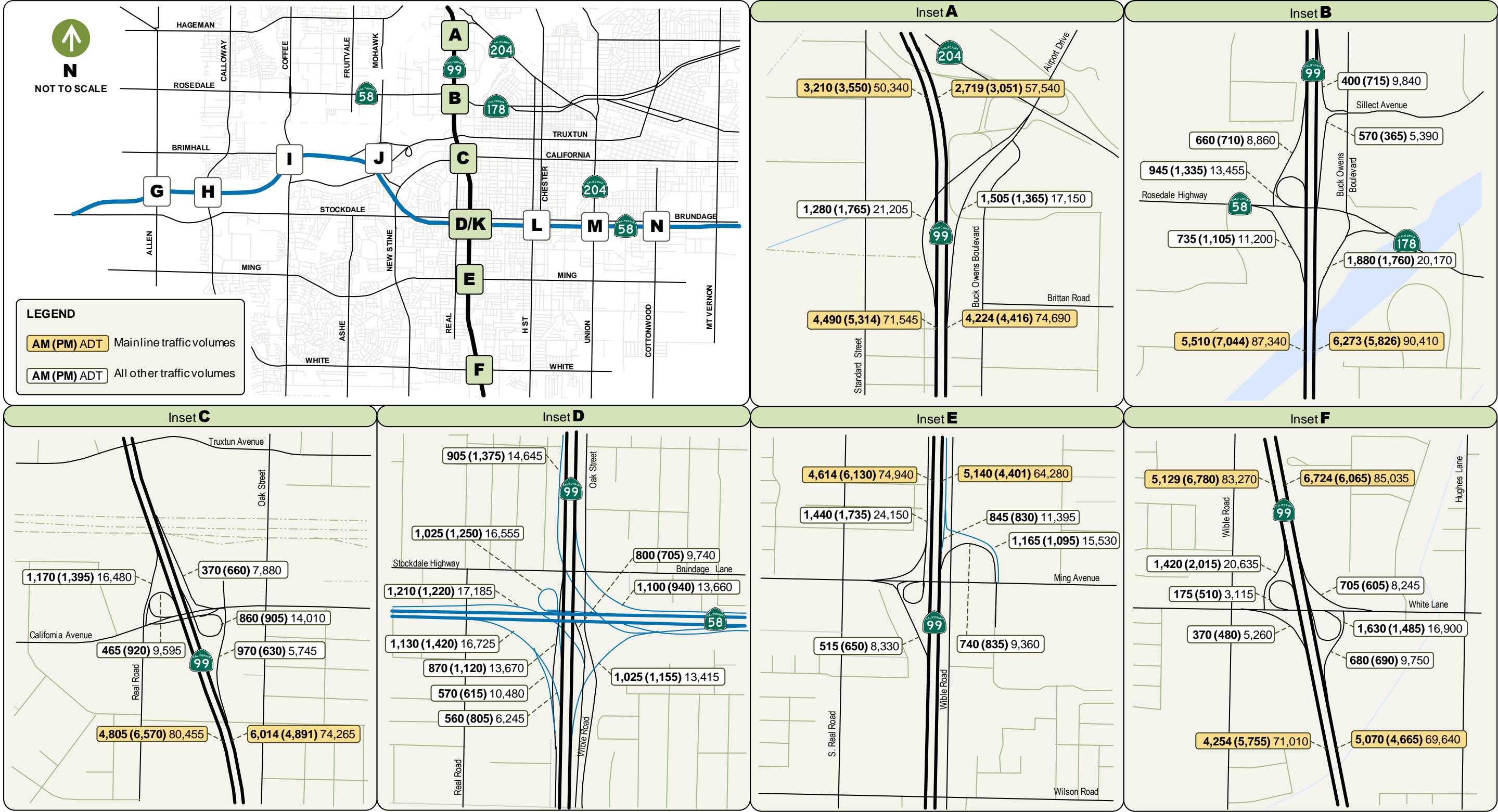
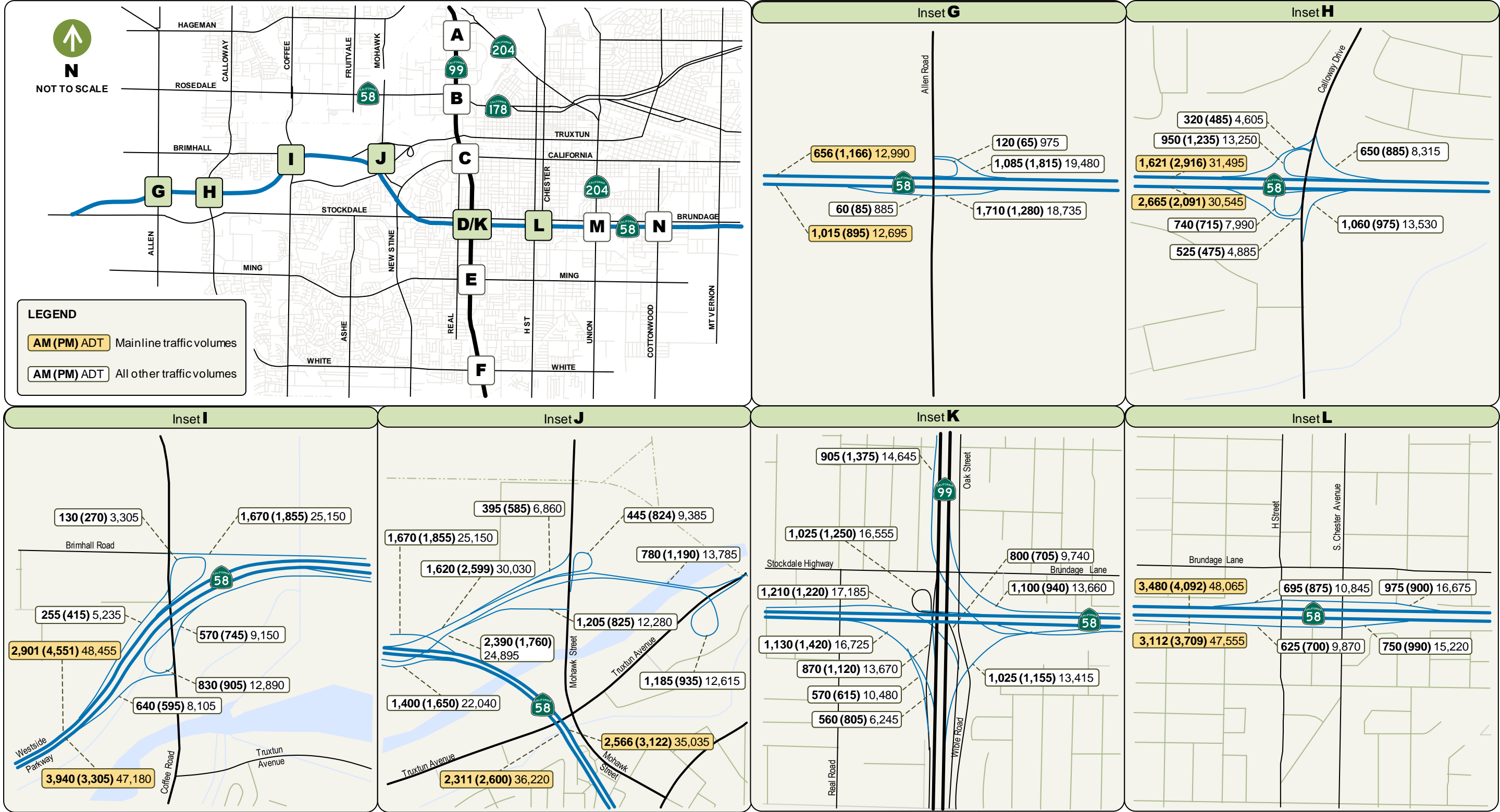


Figure 3-13:  
Year 2038 Peak Hour Intersection Traffic  
Volumes—Alternative A  
(3 of 3)



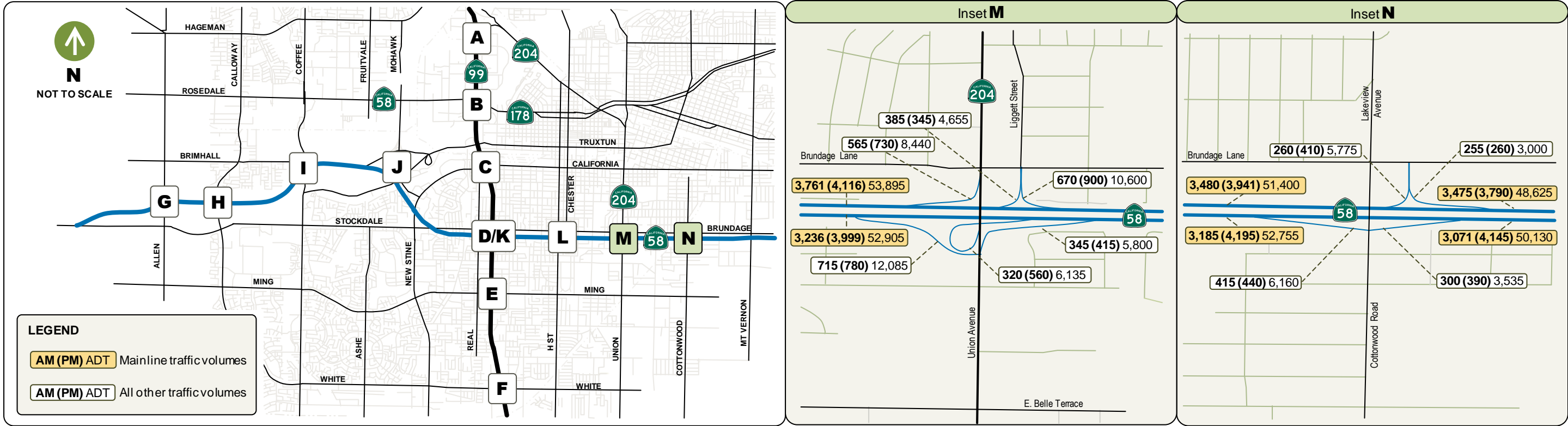
Source: Parsons

Figure 3-14:  
Year 2018 Peak Hour and Daily Freeway  
Volumes—Alternative A  
(1 of 3)



Source: Parsons

Figure 3-14:  
Year 2018 Peak Hour and Daily Freeway  
Volumes—Alternative A  
(2 of 3)



Source: Parsons

Figure 3-14:  
Year 2018 Peak Hour and Daily Freeway  
Volumes—Alternative A  
(3 of 3)

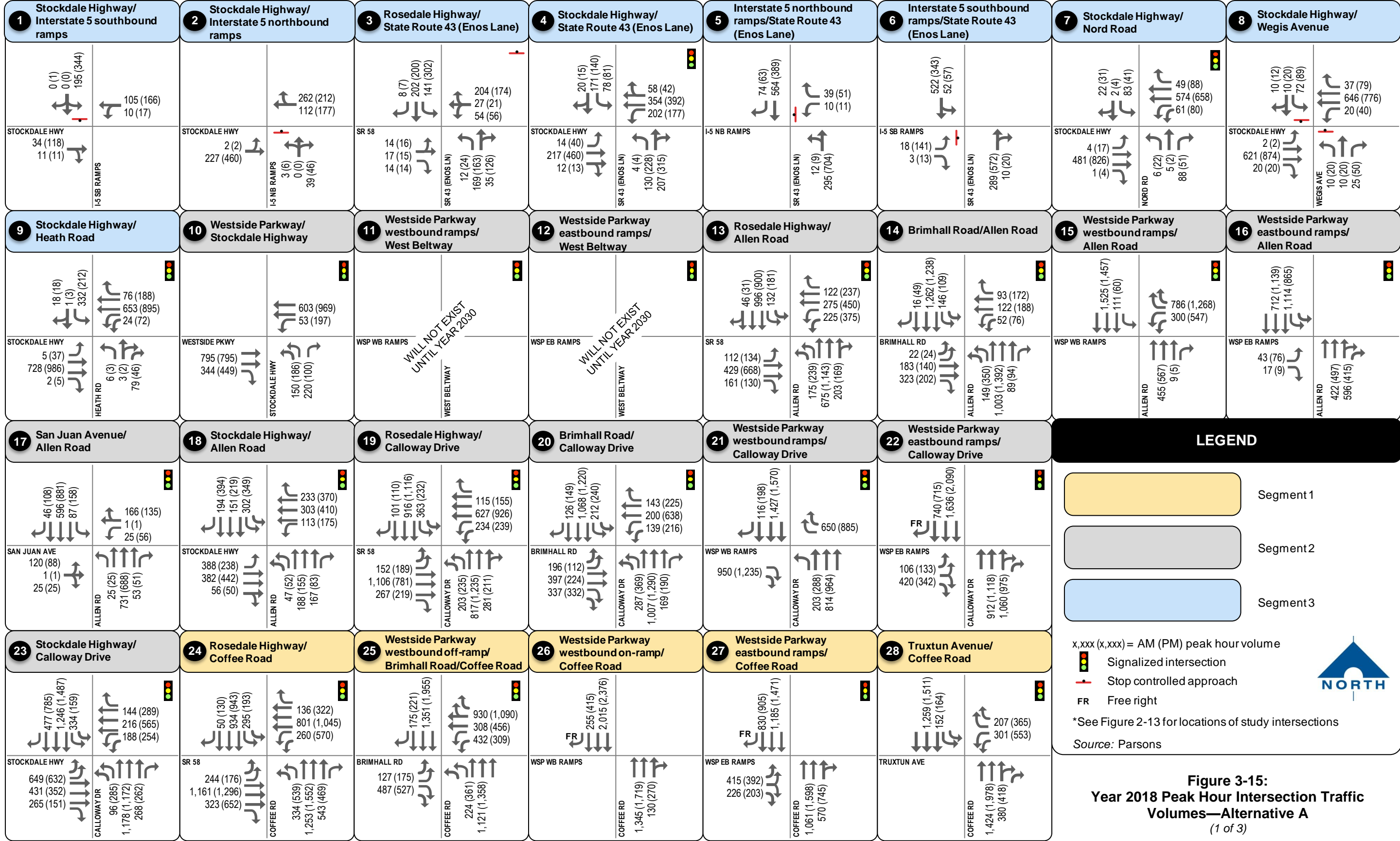


Figure 3-15:  
Year 2018 Peak Hour Intersection Traffic  
Volumes—Alternative A  
(1 of 3)

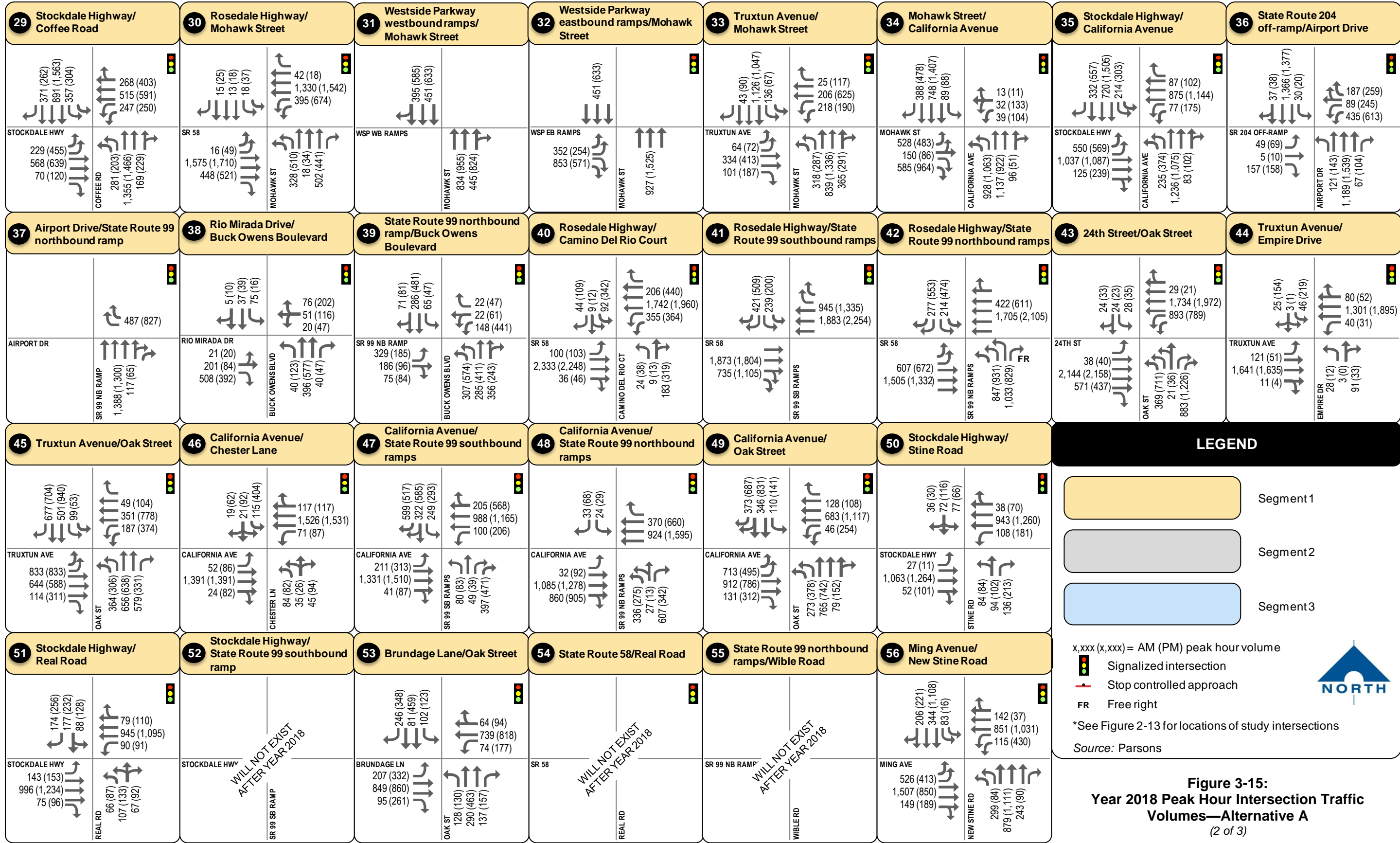


Figure 3-15:  
Year 2018 Peak Hour Intersection Traffic  
Volumes—Alternative A  
(2 of 3)

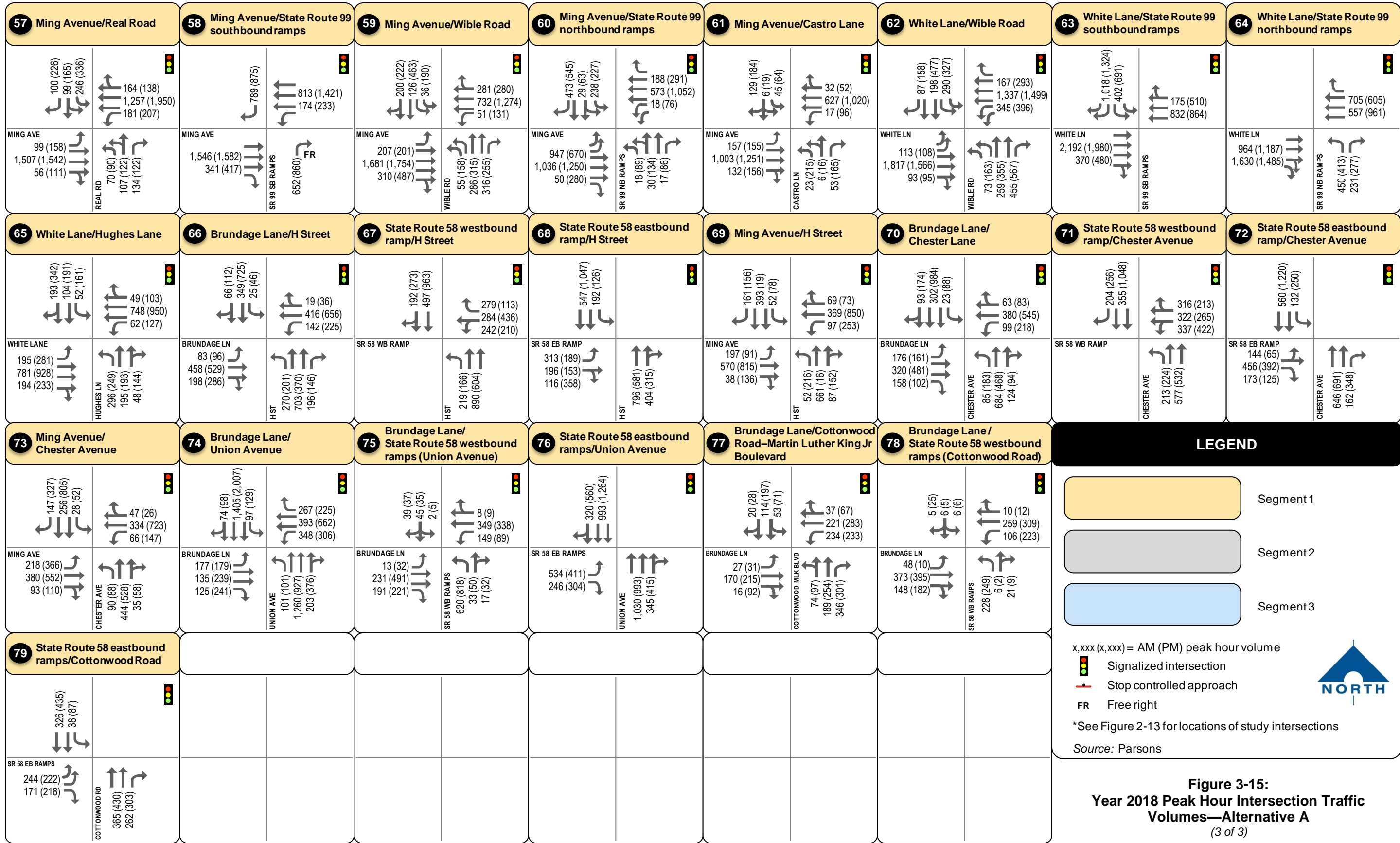


Figure 3-15:  
Year 2018 Peak Hour Intersection Traffic  
Volumes—Alternative A  
(3 of 3)

the southbound State Route 99 to the eastbound State Route 58 connector would be removed. Local access from Real Road to State Route 58 and to southbound State Route 99 would also be removed.

The alternative B new freeway would bisect existing business parks and residential neighborhoods. The following roads are proposed to cross over or under the proposed freeway alignment:

- Truxtun Avenue
- Commerce Drive
- California Avenue
- Marella Way
- La Mirada Drive
- Stockdale Highway and Stine Road
- South Real Road

The potential closure of Monclair Street, Woodlake Drive, Kensington Avenue, Hillsborough Drive, Kentfield Drive, Joseph Drive, Dunlap Street, Ford Avenue, and Williamson Way would modify existing circulation. Pedestrian and bicycle crossing would be limited to the proposed undercrossings or overcrossings, increasing neighborhood travel distances. No GET bus routes use the roadways that would potentially be closed. Therefore, alternative B would not directly affect existing transit service.

Figure 3-16 illustrates the difference between 2038 alternative B and no-build daily traffic volumes, as assigned by the travel forecast model. The bandwidths illustrated in red depict roadways which receive additional volumes of traffic as a result of the constructing the freeway-to-freeway Centennial Project connector. Roadways having bandwidths illustrated in blue indicate roadways receiving less traffic as a result of building the freeway connector. The difference plot is very similar to that provided for alternative A, as the change in mobility and accessibility offered by alternatives A and B is virtually the same.

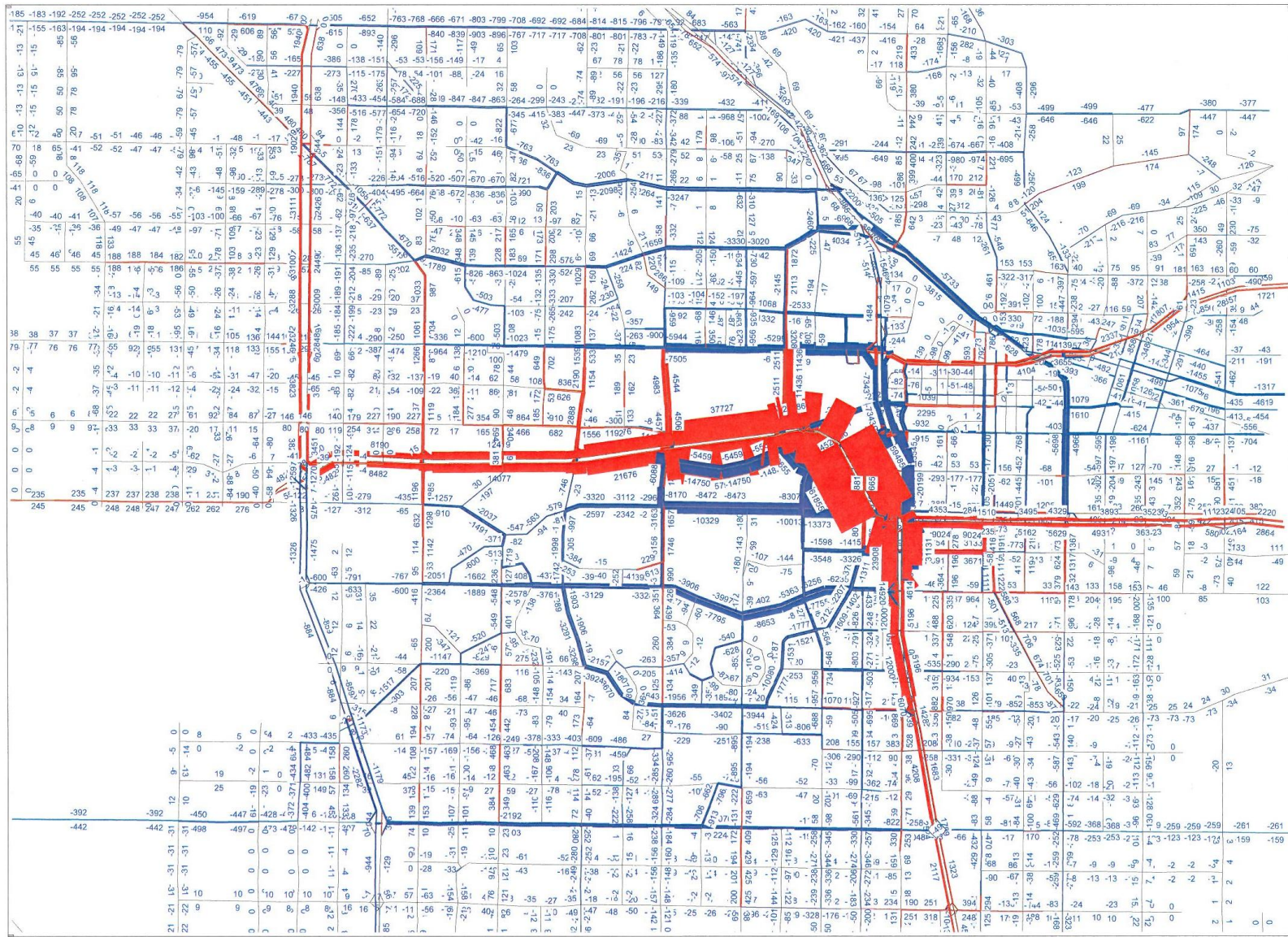
Figure 3-17 depicts the adjusted design year (2038) traffic forecasts for State Route 99 and State Route 58/Westside Parkway under alternative B conditions. Peak hour and daily volumes are reported for all freeway mainline segments and ramps within the Centennial Project study area.

Figure 3-18 reports AM and PM peak hour design year (2038) turning movement volumes for all study intersections.

Figures 3-19 and 3-20 present the same traffic volume information for opening year 2018 conditions.

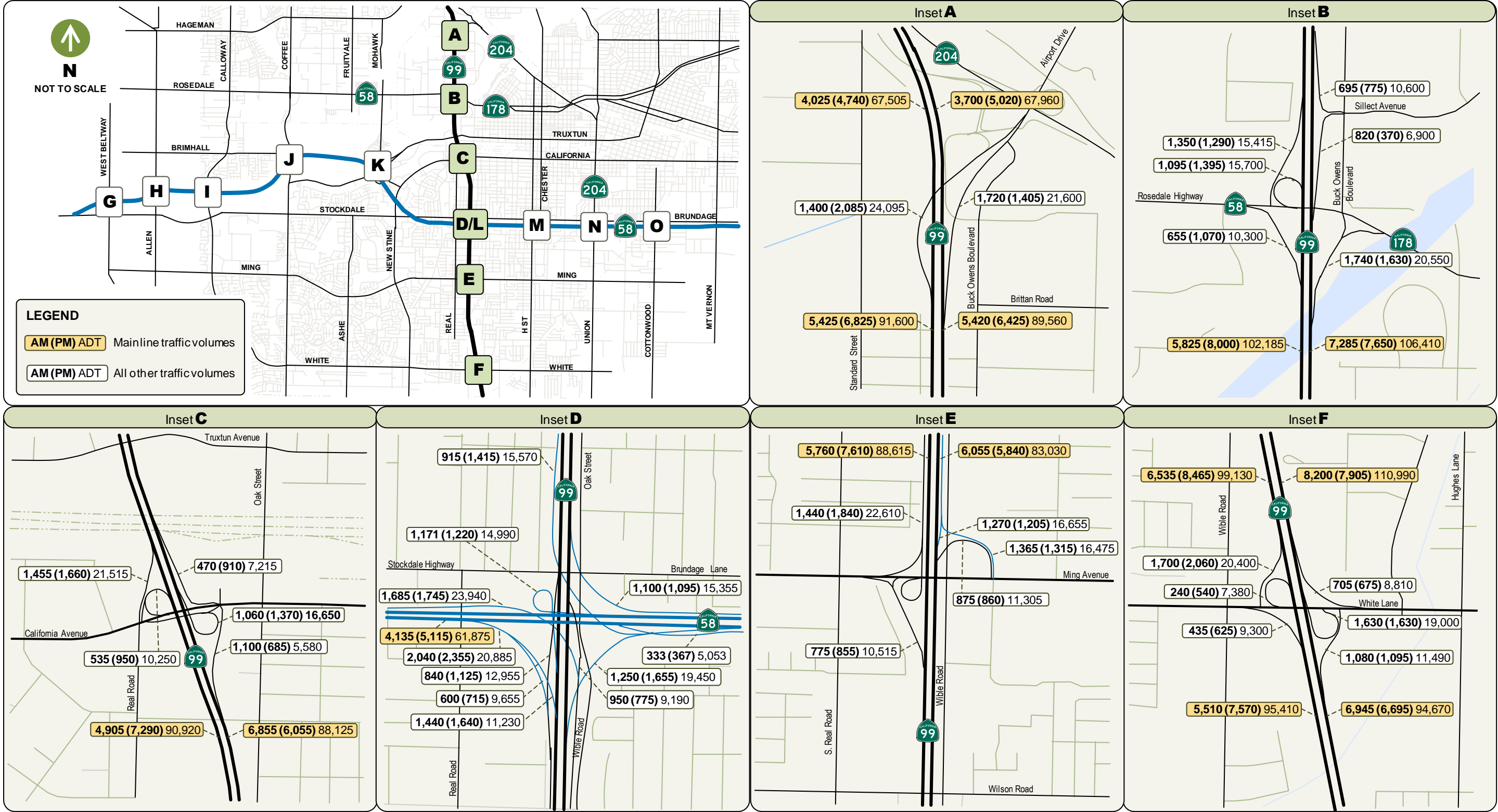
### **Alternative C**

Alternative C proposes to connect the east end of the Westside Parkway to State Route 58 east near Cottonwood Road by means of a new freeway. Starting at the Mohawk Street interchange, this alternative would traverse easterly, spanning the Kern River and Truxtun Avenue, and continue parallel to and south of the BNSF Railway tracks. It would then turn south and continue parallel to and west of State Route 99 for approximately one mile and connect with State Route 58 near the existing State Route 58/State Route 99 interchange. This alternative proposes undercrossings at California Avenue, Palm Avenue, State Route 99, Oak Street and Brundage Lane.



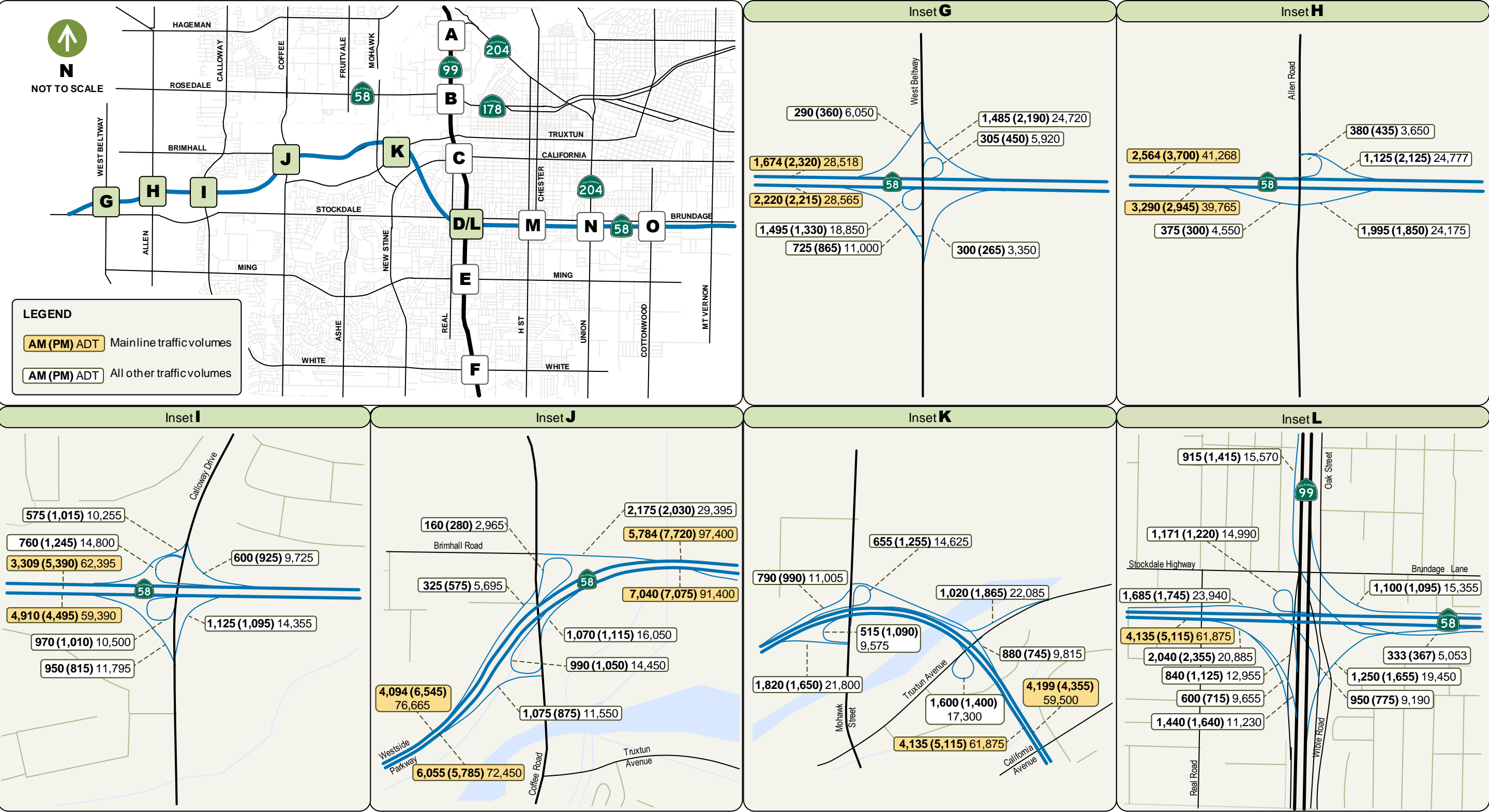
Source: Parsons

Figure 3-16: Difference between Year 2038 Alternative B and the No-Build Alternative Daily Traffic Volumes



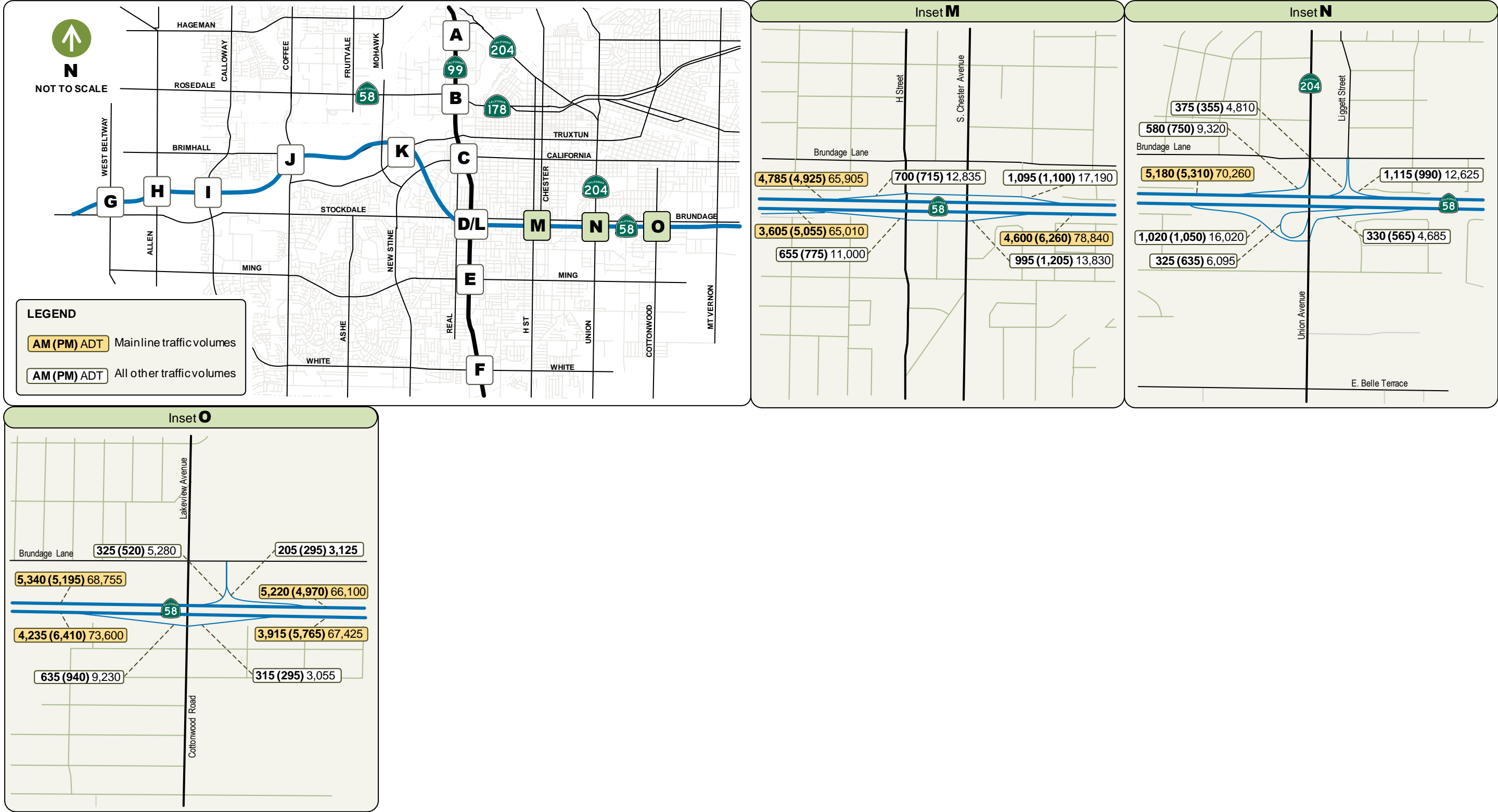
Source: Parsons

Figure 3-17:  
Year 2038 Peak Hour and Daily Freeway  
Volumes—Alternative B  
(1 of 3)



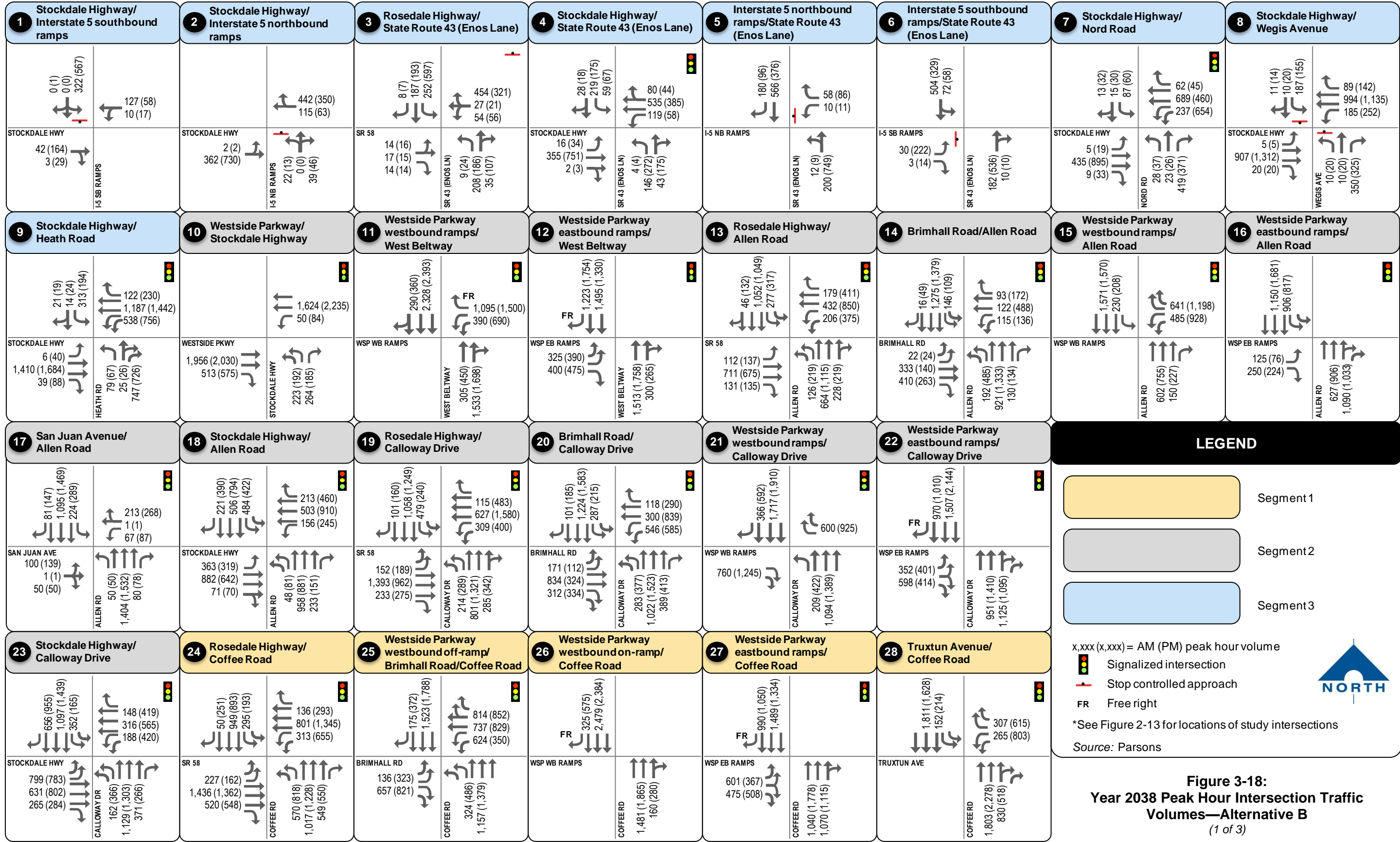
Source: Parsons

Figure 3-17:  
Year 2038 Peak Hour and Daily Freeway  
Volumes—Alternative B  
(2 of 3)



Source: Parsons

Figure 3-17:  
Year 2038 Peak Hour and Daily Freeway  
Volumes—Alternative B  
(3 of 3)



**Figure 3-18:**  
**Year 2038 Peak Hour Intersection Traffic**  
**Volumes—Alternative B**  
(1 of 3)

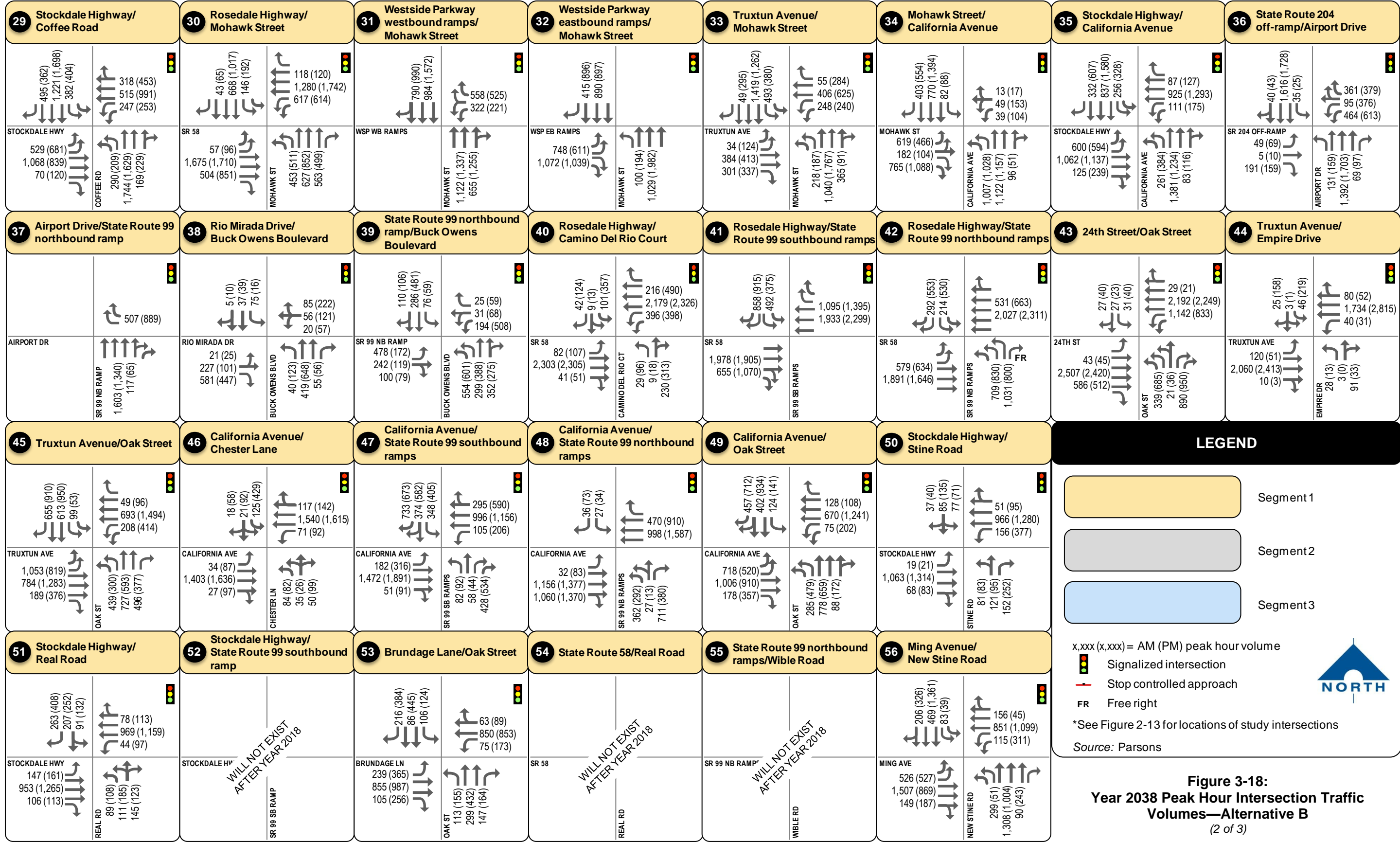


Figure 3-18:  
Year 2038 Peak Hour Intersection Traffic  
Volumes—Alternative B  
(2 of 3)

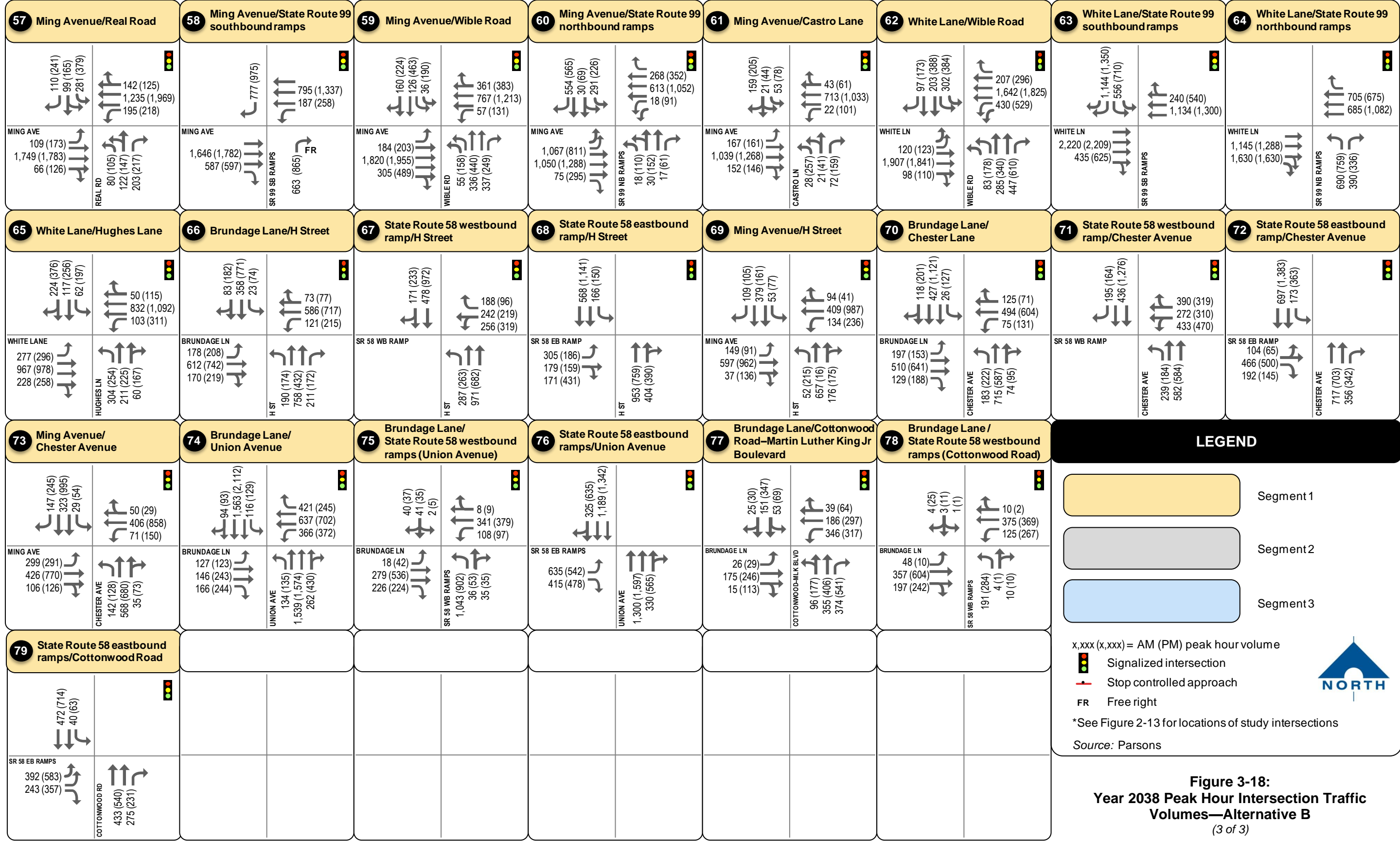
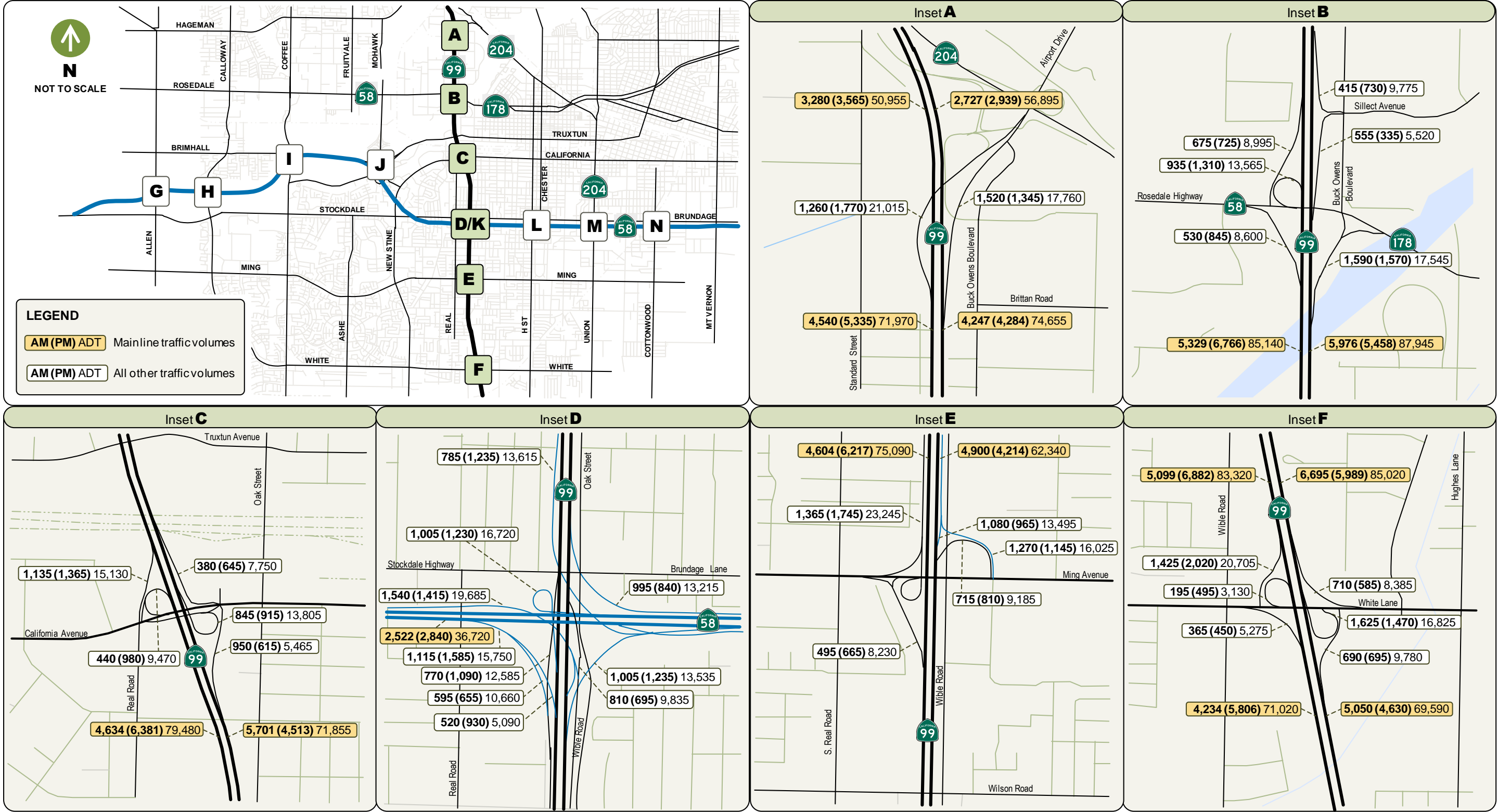
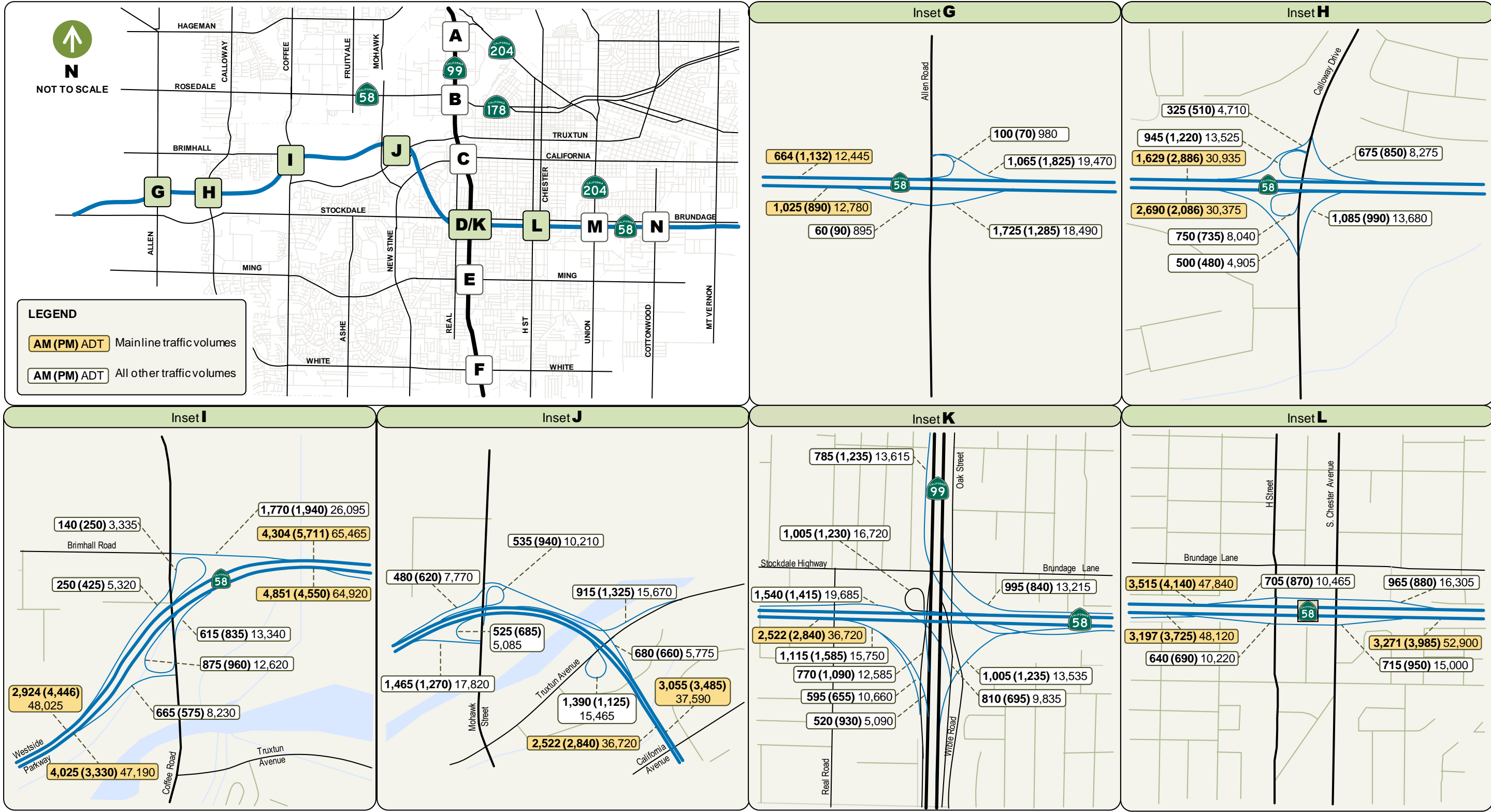


Figure 3-18:  
Year 2038 Peak Hour Intersection Traffic  
Volumes—Alternative B  
(3 of 3)



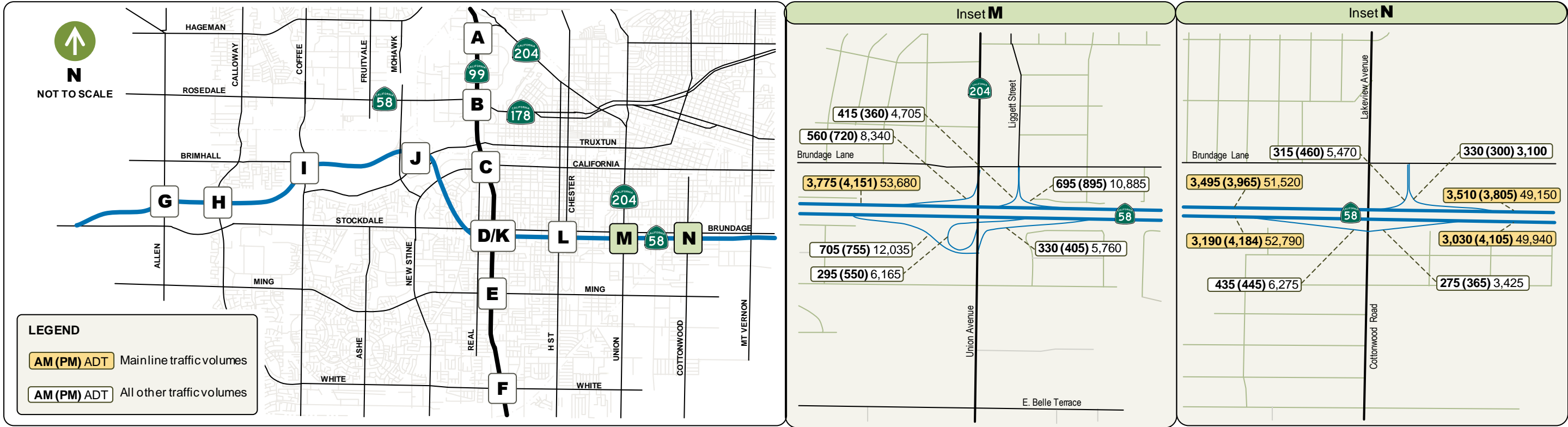
Source: Parsons

Figure 3-19:  
Year 2018 Peak Hour and Daily Freeway  
Volumes—Alternative B  
(1 of 3)



Source: Parsons

Figure 3-19:  
Year 2018 Peak Hour and Daily Freeway  
Volumes—Alternative B  
(2 of 3)



Source: Parsons

Figure 3-19:  
Year 2018 Peak Hour and Daily Freeway  
Volumes—Alternative B  
(3 of 3)

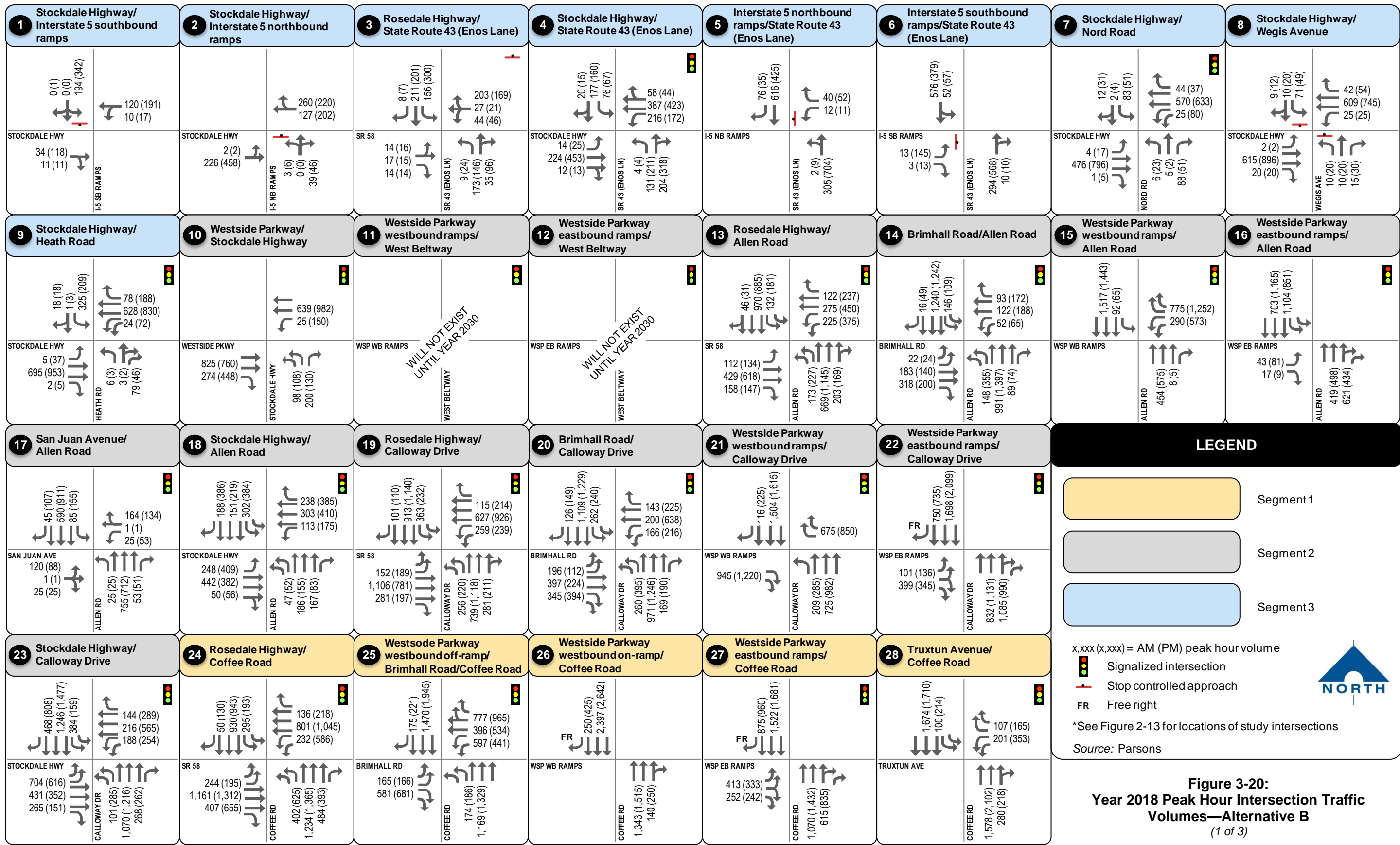
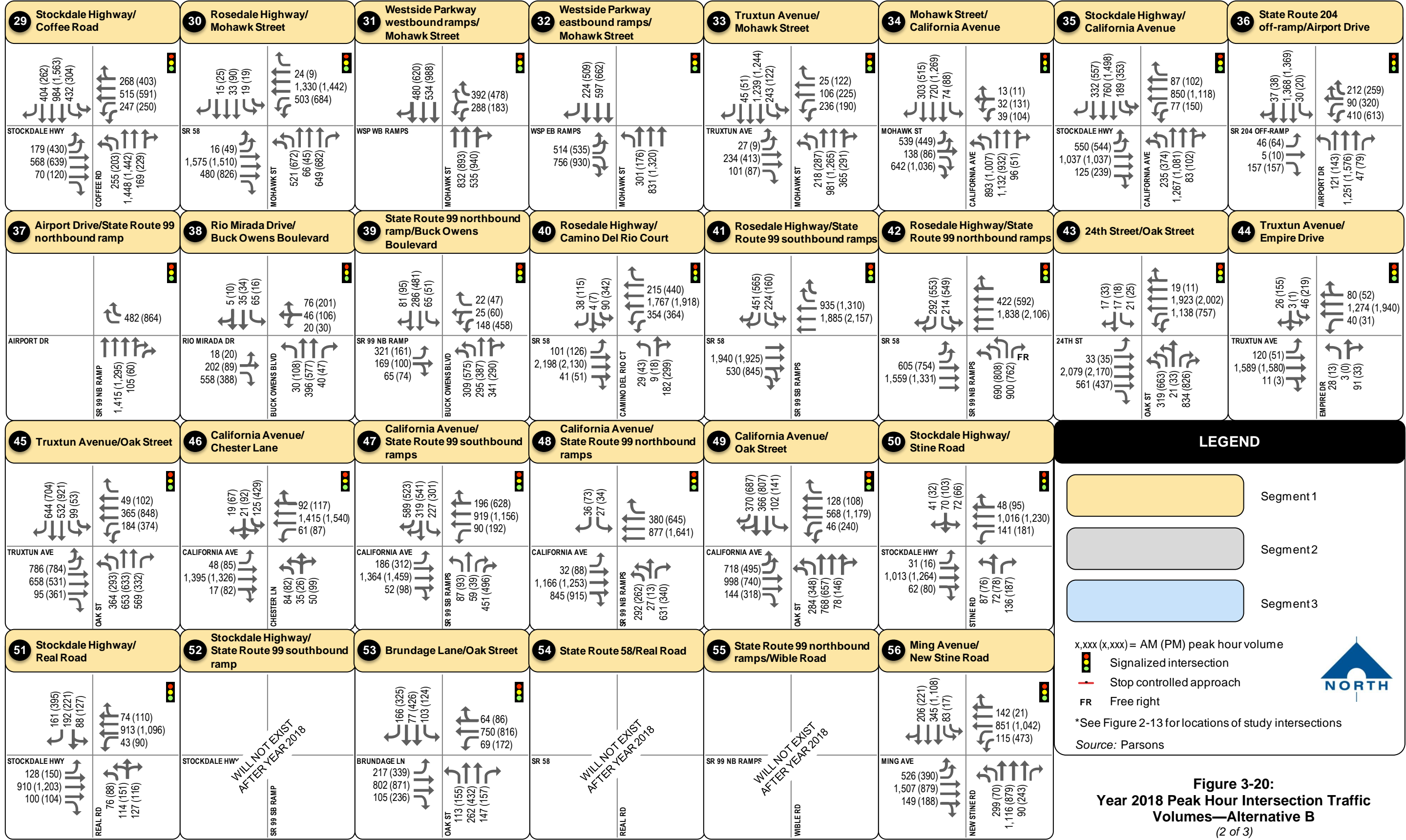


Figure 3-20:  
Year 2018 Peak Hour Intersection Traffic  
Volumes—Alternative B  
(1 of 3)



**Figure 3-20:**  
**Year 2018 Peak Hour Intersection Traffic**  
**Volumes—Alternative B**  
(2 of 3)

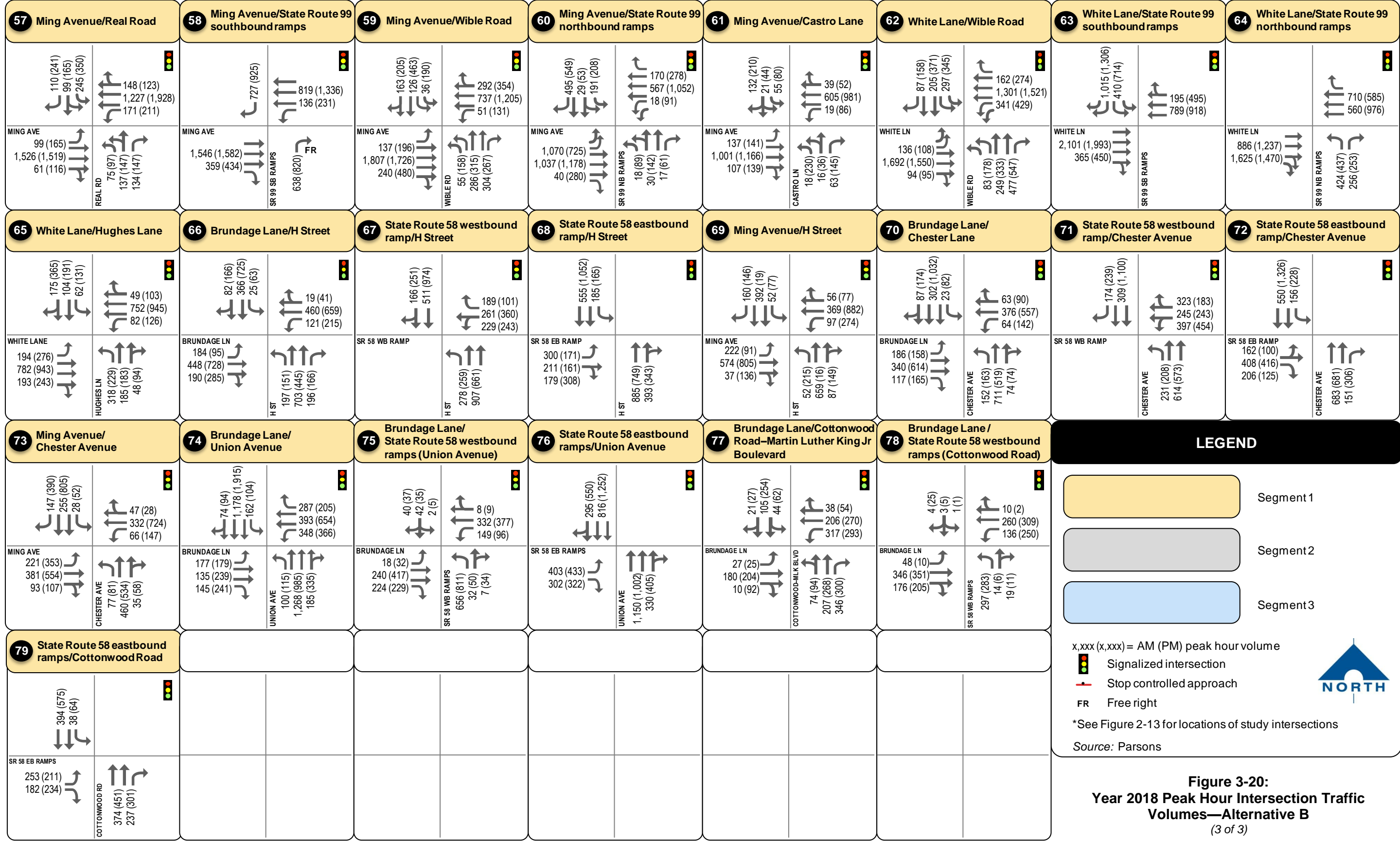


Figure 3-20:  
Year 2018 Peak Hour Intersection Traffic  
Volumes—Alternative B  
(3 of 3)

New branch connectors would be constructed for the eastbound State Route 58 to southbound State Route 99 and the northbound State Route 99 to westbound State Route 58 movements. Auxiliary lanes would be provided on State Route 99 to accommodate the additional traffic from State Route 58. Improvements on State Route 99 would extend from the Wilson Road overcrossing to the Gilmore Avenue overcrossing. A collector-distributor road system would provide access from westbound State Route 58 to northbound State Route 99 as well as from northbound State Route 99 to westbound State Route 58. The Wible Road on and off ramps south of the existing State Route 99/State Route 58 interchange would be removed to accommodate the northbound State Route 99 auxiliary lane. The Stockdale Avenue off ramp from the southbound State Route 99 to the eastbound State Route 58 connector would be removed. Local access from Real Road to southbound State Route 99 would be removed as well.

The following are locations where the new structures would be required for this alternative to allow the listed road to pass under or over the proposed new freeway alignment:

- Truxtun Avenue
- California Avenue
- Palm Street
- Brundage Lane
- Stockdale Highway

As the new freeway would be aligned adjacent to the BNSF railyard and the State Route 99 freeway, it would not bisect existing business parks or residential neighborhoods. The potential closure of Easton Drive would modify existing circulation, however. No GET bus routes use Easton Drive. Therefore, alternative C would not directly affect existing transit service.

Figure 3-21 illustrates the difference between 2038 alternative C and no-build daily traffic volumes, as assigned by the travel forecast model. The bandwidths illustrated in red depict roadways which receive additional volumes of traffic as a result of constructing the freeway-to-freeway Centennial Corridor project connector. Roadways having bandwidths illustrated in blue indicate roads receiving less traffic as a result of building the freeway connector. The difference plot is similar to that provide for alternatives A and B. The wide red bandwidth along State Route 99 reflects the proposed alignment of the alternative C connector, which runs immediately west and parallel to existing State Route 99.

Figure 3-22 depicts the adjusted design year (2038) traffic forecasts for State Route 99 and State Route 58/Westside Parkway under alternative C conditions. Peak hour and daily volumes are reported for all freeway mainline segments and ramps within the Centennial Corridor project study area.

Figure 3-23 reports AM and PM peak hour turning movement volumes for all study intersections.

Figures 3-24 and 3-25 present the same traffic volume information for opening year 2018 conditions.